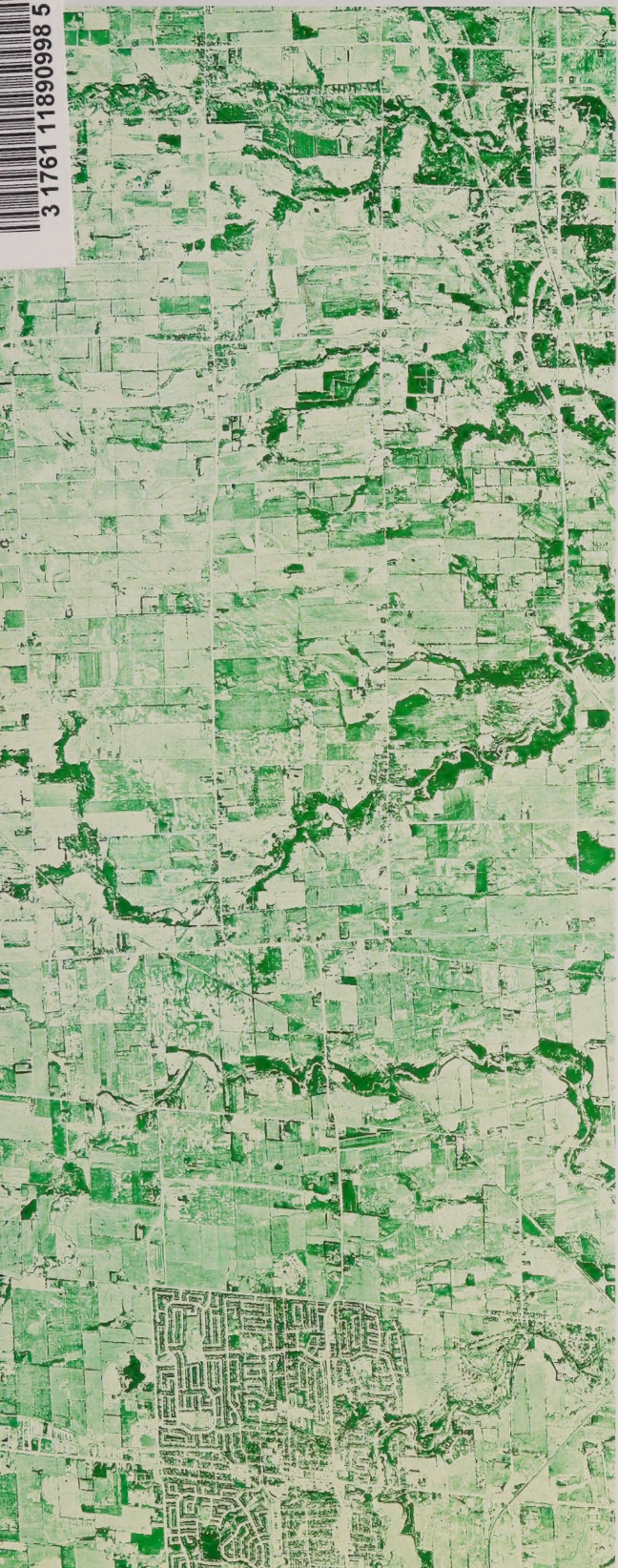


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Ministry
of
Transportation

Government
Publication

Highway 407 / Transitway Markham Road Easterly to Highway 7 East of Brock Road

Environmental Assessment Report

FEBRUARY, 1997



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**Ministry
of
Transportation**

Highway 407 / Transitway Markham Road Easterly to Highway 7 East of Brock Road

Environmental Assessment Report

Executive Summary

FEBRUARY, 1997



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EXECUTIVE SUMMARY

A. BACKGROUND & HISTORY

Highway 407 (see **Exhibit 1**) was initially considered during the 1940s and 1950s and, since that time, has been incorporated into the planning of all major transportation and land use decisions, for what is now known as the Greater Toronto Area (GTA).

In the early part of 1990, the Ministry of Transportation (MTO) carried out a Route Planning study to identify a technically preferred route for Highway 407/Transitway between Markham Road and Highway 35/115. This Route Planning Study evaluated several route alternatives on the basis of a broad range of environmental effects in consultation with affected agencies, municipalities and the public. The study identified a technically preferred route for the facility.

The original schedule for the construction of Highway 407 between Highway 403 in Oakville and Highway 35/115 in Clarington, anticipated a program that would meet the traffic demand without adversely affecting the local road system. However, in the early 1990's the construction of Highway 407 was accelerated when the Province announced a contract to develop, design and build Highway 407 from Highway 403 in the City of Mississauga to Markham Road in the Town of Markham. Under this accelerated program, the Highway 407 contract requires Highway 407 to be completed to Markham Road by the end of 1998. With the acceleration of the construction program for Highway 407 west of Markham Road, the construction of Highway 407 immediately east of Markham Road would not occur in

time to address significant traffic problems in the Markham area.

In early 1996, the Ministry evaluated the feasibility of ways of addressing the traffic concerns related to the planned 1998 completion of Highway 407 to Markham Road.

The Environmental Assessment Report documents the results of the studies that selected the technically preferred route and concluded with the decision to extend Highway 407 and a Transitway from Markham Road to Highway 7 east of Brock Road. The project location is shown on **Exhibit 2**.

B. PROBLEM AND OPPORTUNITIES

Chapter 2 of the EA Report provides a synopsis of the transportation analysis carried out for the project and documents the need for more transportation capacity.

Over the past three decades, numerous planning and transportation studies have been undertaken in west Durham and the eastern portions of Metropolitan Toronto and York Region. All of these studies recognized the transportation related constraints in and around the GTA and the need for additional east-west transportation capacity across the Metro-York/Durham Boundary. A number of these studies also recognized that a combination of roadway, transit and Transportation Demand Management (TDM) improvements is required to satisfy existing and future transportation demands.

For this EA, screenline analyses were carried out for three horizon years: 1998, 2011 and 2021. **Exhibit 3 (a)** displays the analysis for a scenario with Highway 407 extending to

Markham Road, while **Exhibit 3 (b)** shows the analysis of a scenario with Highway 407 extending to Brock Road/Highway 7 as a 4-lane "interim" freeway facility.

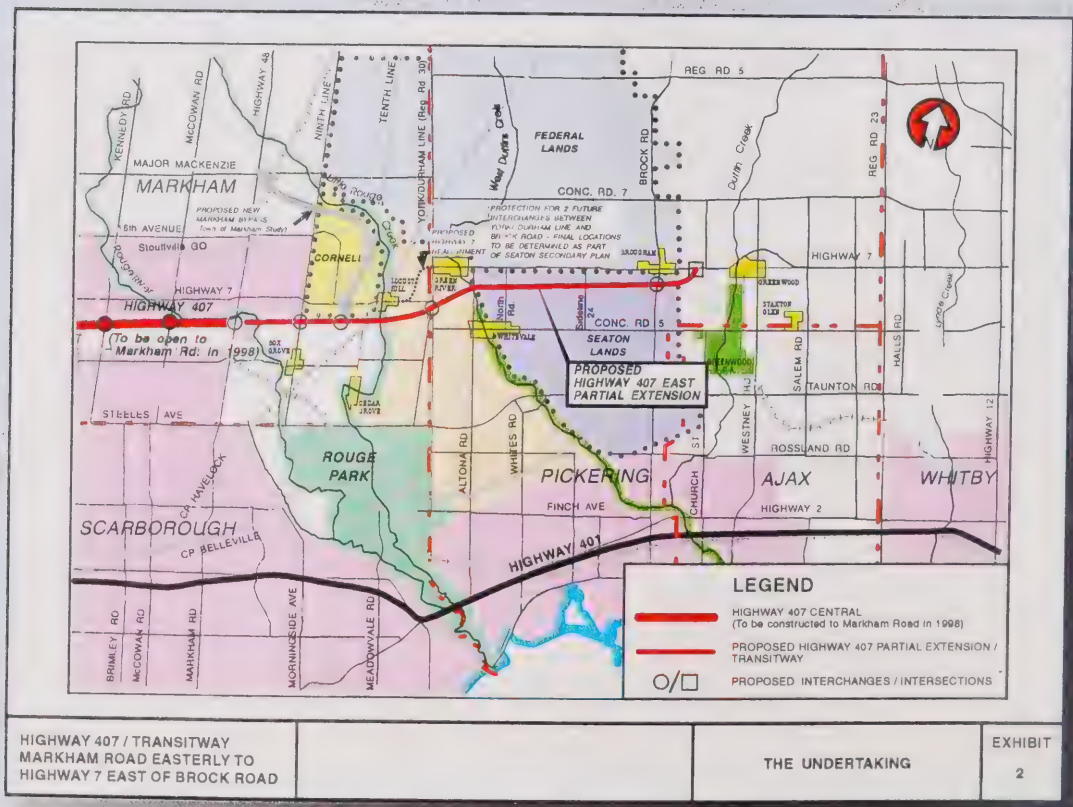
1998 Deficiencies

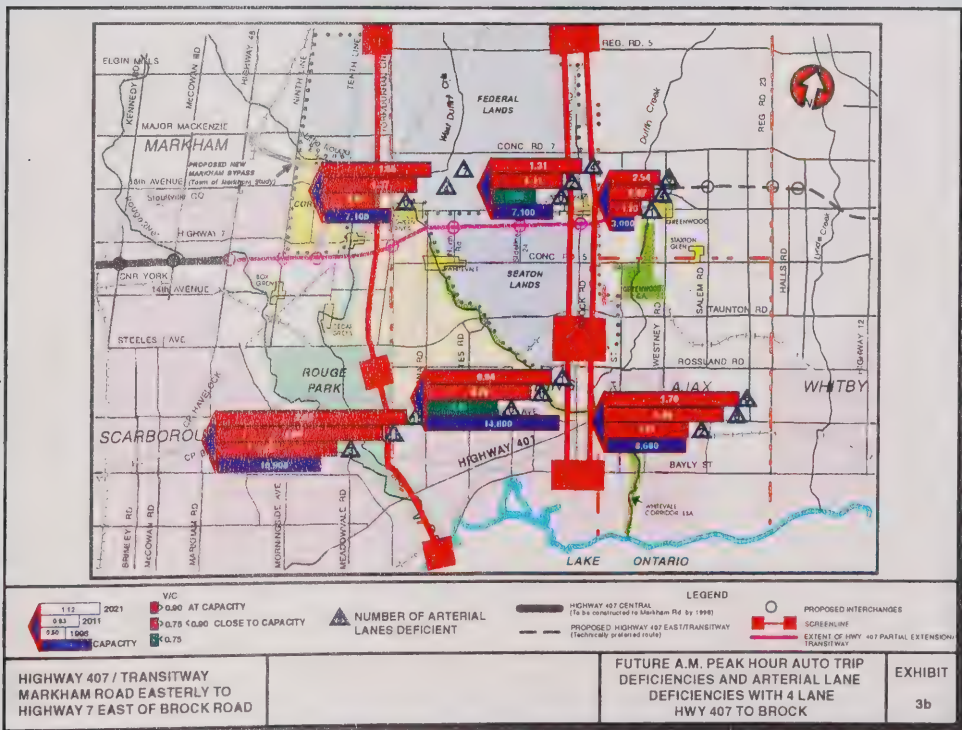
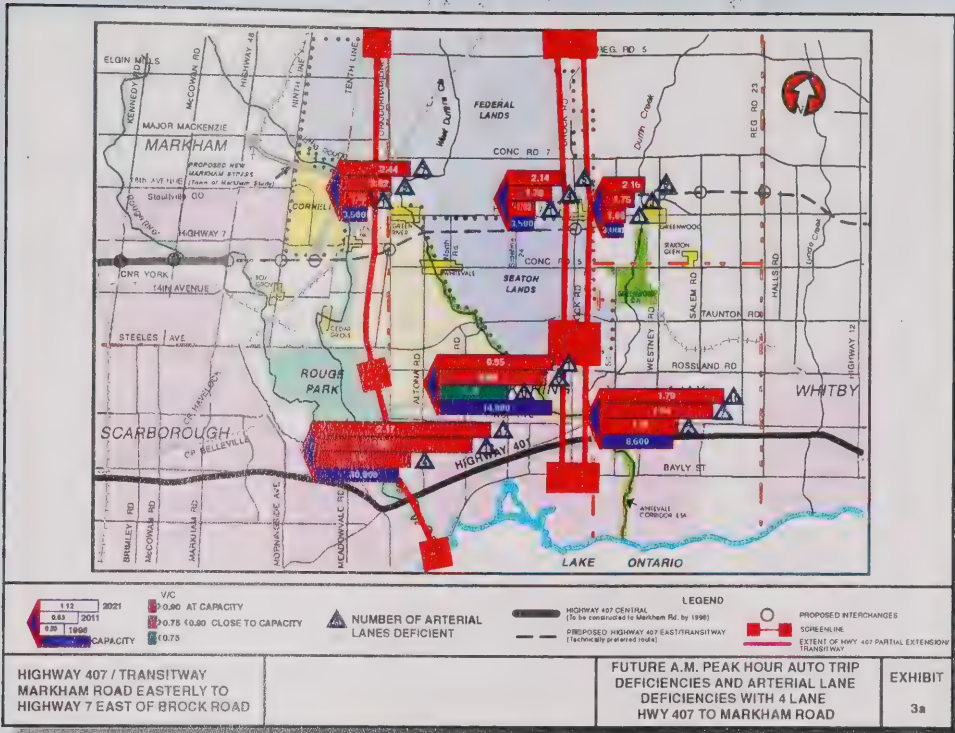
The traffic analysis demonstrates that when Highway 407 Central opens to Markham Road, the following conditions can be expected:

- Markham Road between Highway 7 and Highway 407 will be *extremely congested*;
- the Highway 7 corridor will have a capacity deficiency equivalent of 1-

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- A. BACKGROUND & HISTORY
- B. PROBLEM AND OPPORTUNITIES
- C. STUDY AREA
- D. ALTERNATIVES TO THE UNDERTAKING
- E. EXISTING CONDITIONS
- F. ROUTE PLANNING ALTERNATIVES
- G. RATIONALE FOR THE UNDERTAKING
- H. DESCRIPTION OF THE UNDERTAKING
- I. SUMMARY OF CONCERNS AND COMMITMENTS
- J. CONCLUSIONS





2 lanes of arterial capacity (one-way);

- traffic is expected to increase on: Highway 7 east of Markham Road; 14th Avenue; and Whitevale Road. This will result in increased traffic through the communities of Box Grove, Green River, Locust Hill, Whitevale, Brougham and Greenwood; and
- there will be deficiencies across the Metro-York/Durham boundary, even with the completion of the widening of Highway 401 to 12 lanes as far as Brock Road.

2011 Deficiencies

By 2011, there are expected to be *major* capacity deficiencies crossing the Metro-York/Durham boundary for both person and road demands. Transit ridership is estimated to increase by more than 50% in the peak hour across the boundary over 1998 volumes.

It also is expected that high density employment nodes will continue to be developed along the Highway 7/407 corridor through Markham and Vaughan, thereby creating opportunities for a major transit corridor to capture transit riders. The provision of transit in the Highway 7/407 corridor is essential to link Durham with York Region and north Metro through high quality transit connections and to achieve the transit capacity needed by 2011.

Even with Highway 407 as a four lane facility across the boundary (i.e. to Brock Road/Highway 7), there will be a total deficiency across the Metro-York/Durham boundary equivalent to 15 arterial lanes (one-way) across the entire screenline. In the Highway 7/407

corridor alone, there will be a capacity deficiency of 4 arterial lanes (one-way).

By 2011, there will be a deficiency east of Brock Road equivalent to a total of 10 arterial lanes (one-way) with or without the extension of Highway 407 to Brock Road.

2021 and Beyond

Studies show that both population and employment in the Region of Durham will more than double between 1998 and 2021¹.

Projections for the year 2021 show deficiencies at the Metro-York/Durham boundary in the Highway 401 and Highway 7/407 corridors of 15 and 7 arterial lanes respectively.

Beyond 2021, the GTA is expected to continue to be a major focus of industrial and business activity in Ontario. Therefore, while travel patterns may change and be mitigated by changes affected by demand, supply and growth management strategies, the travel *demands in both the Highway 401 and Highway 7 corridors are expected to continue to grow*.

Summary of Deficiencies

It is clear from the analysis carried out for this study and supported by past studies that there is a need for additional road and transit capacity within the Highway 7 corridor east of Markham Road. There are also limited opportunities for meeting this need through additional arterial capacity. It was on the basis of this need that the planning for the Highway 407 /Transitway was carried out.

C. STUDY AREA

For the purposes of the system planning phase and transportation analysis, the study area included the Greater Toronto Area (GTA) and adjacent regions influencing the travel demands within the GTA.

When reviewing extension/staging options, a study area between Markham Road and Sideline 14 in the Town of Pickering was used (see **Exhibit 4**).

The study areas were determined taking into consideration existing and proposed land uses, environmental constraints, transportation network need and comments received during the consultation process.

D. ALTERNATIVES TO THE UNDERTAKING

Chapter 3 of the EA Report provides a description, assessment and evaluation of the planning alternatives which could be implemented to resolve the transportation/traffic problems presented in Chapter 2. The following alternatives were considered:

Do Nothing - This alternative assumes that Highway 407 will be completed and opened to Markham Road from the west, in 1998. It also assumes that there will be no improvements to increase vehicular and/or person trip capacity in and through the Durham Region in 1998, other than the ongoing widening of Highway 401 to Brock Road in Pickering. The study concluded that the do nothing alternative is not a practical solution to the problems being addressed in this study.

Improvements to Transit Service - This alternative includes possible improvements to GO Rail, heavy rail service, and local and inter-regional municipal transit. The study

1 Population and Employment Outlook for the Greater Toronto Area, Hemson and Coopers & Lybrand, August 1993



HIGHWAY 407 / TRANSITWAY
MARKHAM ROAD EASTERLY TO
HIGHWAY 7 EAST OF BROCK ROAD

STUDY AREA

EXHIBIT
4

concluded that transit improvements will not by themselves satisfy existing or future travel demands across the Metro-York/Durham boundary, or resolve anticipated traffic problems in the Markham Road area.

Improved Transportation System Management Measures (TSM) - This alternative involves measures to maximize existing infrastructure capacity such as improved signalization, addition of turning lanes at intersections, etc.

The analysis concluded that TSM measures could result in minor localized improvements on roadways within the Study Area. However, they will not adequately address the traffic problems in the Markham Road area. They will also not adequately address existing or future deficiencies in transportation system capacity across the Metro-York/Durham boundary.

Promotion of Transportation Demand Management (TDM) Improvements - This alternative includes such measures as telecommuting, trip sharing, developing High Occupancy Vehicle (HOV) systems, etc. The study concluded that TDM measures do not represent a practical solution to the defined short term problems in the Markham Road area and the deficiencies across the Metro-York/Durham boundary.

Upgrade Arterial/Municipal Roadways - This alternative involves expanding the existing municipal system to provide additional travel lanes and/or HOV or transit only lanes. However the analysis concluded that there is limited opportunity in both the short and long terms to affect the capacity concerns at Markham Road or increase the capacity across the Metro-York/Durham boundary

using existing or future arterial roads.

Growth Management - This alternative involves land use strategies to increase employment to population ratios thereby reducing the number of work trips across the Metro - York/Durham boundary. In the short and medium term time-frames (up to 20 years), there will be limited opportunities to affect significant changes in travel patterns through growth management. Therefore, this alternative has little potential for addressing the traffic problems and capacity deficiencies.

Extend Highway 407 Easterly - This alternative involves the extension of Highway 407 and a new transitway easterly from Markham Road. This alternative is the only planning alternative that will adequately satisfy existing and future transportation /traffic and social (community) issues.

Conclusion:

The analysis of the foregoing alternatives resulted in the decision that:

- Extending Highway 407 east of Markham Road as an "interim" 4-lane facility is a logical first priority in the package of improvements to resolve existing short term capacity deficiencies across the Metro-York/Durham boundary and traffic problems within communities in the Highway 7 corridor ("the problem"). This improvement, compared to the other planning alternatives, is the only one that satisfies both short and longer term mobility requirements.

- In recognition of the future anticipated travel demands a right-of-way for a basic 10-lane freeway facility will be protected for at this time.

- Also, in recognition of the future transit demands, as articulated in Chapter 2 of the EA Report, there is a defined need to protect for a higher

order transit facility or transitway which will parallel Highway 407.

The "key" reasons for the recommended planning alternative include:

- In the short term, it provides the maximum relief to the transportation problems related to the termination of Highway 407 at Markham Road. It also provides maximum relief to east-west capacity constraints across the Metro-York/Durham boundary.

- It represents a critical component in the future transportation networks for the Regions of Durham and York as previously identified in the Highway 407 Overview Study and the Regional Official Plans.

- It provides the opportunity to protect an appropriate right-of-way that allows for higher order transit service in the future.

- Improved transit services, TSM and TDM measures, upgrading of existing arterials and municipal roadways and community growth management within Durham, will not solve the short-term transportation problems.

- Even though the easterly extension of Highway 407 as a 4 lane facility will provide significant east-west capacity across the Metro-York/Durham boundary, it will not be able to satisfy all cross boundary traffic demands in year 2011 and beyond. The traffic analyses carried out for this Study have identified that an ultimate 10-lane extension of Highway 407 would best address the long-term capacity deficiencies within the study area.

Both the future 10-lane freeway and the transitway will form part of a balanced transportation plan for Durham, York and Metro and will serve to partially address future travel demand requirements in the Highway 7/407 corridor.

E. EXISTING CONDITIONS

Chapter 4 of the EA Report describes the existing conditions within the study area. The soils in the entire study area are classified as having Class 1-2 capability for agriculture. Although much of the area is in agricultural usage, the local Official Plans designate most of the land for non-agricultural uses. The exception is the Rouge-Duffins Agricultural Area between the Little Rouge and West Duffins Creeks.

Urban development is currently focused in the Town of Markham and in rural hamlets including Box Grove, Green River, Locust Hill, Whitevale and Brougham. Future urbanization is planned with major developments proposed in the Cornell and Seaton areas. Because of the proximity of the corridor to existing and proposed developments, noise and visual impacts were a consideration during route planning and assessment.

The major natural features in the study area are associated with the north-south oriented watercourses. Terrestrial and aquatic studies conducted for the EA show that the watercourses and valleys associated with the Rouge River, Little Rouge Creek, West Duffins Creek, Urfé Creek and a tributary of the West Duffins Creek and Brougham Creek provide the most significant fisheries and wildlife habitat.

These valley systems also provide valued corridor functions and therefore were a major consideration throughout the study. Many of these valley systems are within the proposed Rouge North Park, and the Whitevale Corridor ESA.

In addition to the valley systems, areas of upland vegetation were identified with certain significant

woodlots in the Town of Markham being avoided during route planning.

There are zones of high water table, groundwater recharge and upwelling that were important considerations in the identification and assessment of route alternatives.

The study area has numerous archaeological sites and several historical buildings. Therefore, impacts to heritage resources were considered during the assessment of alternatives.

The existing transportation network in the study area is comprised of a combination of federal, provincial and municipal roadways and transit systems. As discussed in Section B, dealing with problems and opportunities, this transportation system is currently experiencing considerable congestion and will be unable to handle the anticipated increase in travel demand.

There are no existing utilities nor geotechnical conditions within the study area that were considered to represent a major constraint during route identification or evaluation.

Based upon a thorough understanding of the study area, 26 factors and 88 associated indicators were identified and used in the evaluation of route alternatives. These indicators are described in Appendix 1 to the EA Report.

F. ROUTE PLANNING ALTERNATIVES

Chapter 5 of the EA describes the Route Planning phase of the study in detail. This phase of the study was completed in 1992. During this phase of the study, alternative route segments were identified using a constraints approach. In other words major constraint areas were avoided where possible. The route alternatives, and constraints affecting their selection

are shown in **Exhibit 5**. The various route segments were assessed with respect to their impact on 88 indicators under the following factor areas:

- Natural Environment
- Social Environment
- Cultural Environment
- Agriculture
- Economic Environment
- Transportation and Engineering

The assessment led to the identification of the Technically Preferred Route shown in **Exhibit 2**.

Throughout the identification, assessment and analysis of alternatives, external agencies, municipalities, special interest groups and the public were consulted. This consultation involved mailings, meetings, and Public Consultation Sessions. The consultation process is described in detail in Chapter 1 of the EA.

The Technically Preferred Route was presented to the stakeholders and comments were invited. In response to a request from special interest groups, an alternative location for crossing the Little Rouge Creek was investigated and eventually selected because it crossed at a less environmentally sensitive location.

Significant traffic increases are anticipated on the road network east of Markham Road with the opening of Highway 407 to Markham Road, and it has been determined that an extension of Highway 407 east of Markham Road is the best available solution.

Subsequently 3 extension staging options were identified and evaluated. These included extensions to:

- the proposed Markham Bypass;
- the Durham-York Line; and
- Highway 7 east of Brock Road.

Each option followed the technically preferred route identified through the Route Planning phase.

The 3 options, along with the "Do-nothing Option", were evaluated in light of the environmental, social, cultural, agricultural, economic and transportation implications. Since many of the impacts had already been dealt with during the Route Planning phase, the key determining factor in evaluating the extension staging options was the traffic implications in the communities of Markham, Green River, Whitevale, Box Grove, Locust Hill, Brougham and Greenwood. **Exhibit 6** shows the projected traffic impacts of each option on the local communities based on traffic modelling.

As described in Chapter 5 of the EA, the extension to Highway 7 east of Brock Road was necessary to minimize any potential increase in traffic through local communities. This extension results in a lowering of traffic in all communities other than Greenwood. Although the traffic increase in Greenwood is not expected to be significant, the Town of Pickering and Region of Durham are currently investigating a combination of traffic calming and roadway improvements to address these traffic concerns.

G. RATIONALE FOR THE UNDERTAKING

The environmental assessment concluded that the selected route was optimal from a number of standpoints including:

- The route takes maximum advantage of opportunities to avoid social, environmental, and engineering constraints identified through the data collection process;
- The route minimizes impacts upon established communities;
- The route is the most compatible with federal, provincial and municipal policy initiatives; and

- The preferred alternative is reasonably direct through the study area.

Furthermore the study concluded that the immediate extension to Highway 7 east of Brock Road was preferred for the following reasons:

- Terminating Highway 407 at Markham Road (i.e. Do Nothing) is not a desirable option because it does not address the significant traffic problems that will be experienced in the Town of Markham and communities east of Markham Road with the opening of Highway 407;
- Many of the public comments received expressed a general desire to extend Highway 407 to the east of Brougham as soon as possible;
- Although this option impacts the natural and cultural environment, and agricultural lands, it reduces projected traffic volumes on Markham Road and within the villages of Green River, Whitevale, Locust Hill, Box Grove and Brougham, without significantly increasing the traffic volumes through other communities. The other options did not result in reduced traffic volumes in all of these communities.
- This option is acceptable to the Town of Markham and the Regional Municipality of York because it relieves the future traffic volumes in the Town of Markham, Box Grove and Locust Hill, and supports the Cornell development.
- This option is strongly preferred by the Town of Pickering and the Regional Municipality of Durham because it relieves the future traffic volumes in Green River, Whitevale and Brougham, and supports economic development in the Durham Region.
- There is also general public support for this option because it will reduce traffic volumes in the communities along the route.
- This option crosses several significant watercourses, and concerns have been expressed by regulatory agencies, interest groups and the public. The impacts have been reduced through the development of an

alignment through the Route Planning Study that avoids more sensitive environmental features. In addition, bridges are proposed at the major river crossings to further reduce the impacts on vegetation, fisheries and wildlife. Extensive consultation with affected stakeholders during the Feasibility Study resulted in the development of a Stakeholder Consultation Process, which identifies commitments to future work and mitigation of environmental impacts during the design and implementation phase. It also specifies a process through which stakeholders are involved with the design and construction process. As well, further public consultation sessions will be held to receive additional input. These commitments are discussed in more detail in Section I below, and in Chapter 6 or the EA Report.

H. DESCRIPTION OF THE UNDERTAKING

In 1997, the EA Act was amended. This EA for Highway 407 and a Transitway is being submitted in accordance with the transition provisions of the amended Act. As such, MTO has requested to have Part II of the previous EA Act; and those provisions of Part II of the new Act with respect to mediation and the Section 12.2 activities permitted before approval, to apply to this EA.

The location of the undertaking for which approval is being sought is illustrated in **Exhibit 2**. The undertaking includes the:

- Design, construction, operation and maintenance of a freeway (up to 10 basic lanes) with a basic minimum 100m right-of-way from Markham Road easterly to Highway 7 east of Brock Road;
- Design, construction, operation and maintenance of a transitway with a basic minimum 60 metre right-of-way from Markham Road easterly to Highway 7 east of Brock Road;

407 Terminus at	Green River Hwy 7 East of RR30 Westbound		Whitevale Conc.5 East of Allona Westbound		Locust Hill Hwy 7 East of 10th Line Westbound		Box Grove East 14th Ave East of Ninth Westbound		Box Grove West 14th Ave West of Ninth Westbound	
	Increase/Decrease		Increase/Decrease		Increase/Decrease		Increase/Decrease		Increase/Decrease	
	volume [1]	% diff. [2]	volume	% diff.	volume	% diff.	volume	% diff.	volume	% diff.
Markham Road										
Markham By-Pass	85	10%	10	5%	100	15%	40	10%	-100	-10%
York Road 30	125	15%	10	5%	460	-60%	-170	-35%	-110	-15%
Brock Road/Hwy 7	-40	-5%	-15	-5%	-355	-45%	-45	-10%	-160	-20%

407 Terminus at	Brougham East Hwy 7 East of Brock Westbound		Brougham West Hwy 7 West of Brock Westbound		Greenwood East 8th Conc. East of Westney Westbound		Greenwood West 6th Conc. West of Westney Westbound	
	Increase/Decrease		Increase/Decrease		Increase/Decrease		Increase/Decrease	
	volume	% diff.	volume	% diff.	volume	% diff.	volume	% diff.
Markham Road								
Markham By-Pass	35	5%	40	5%	-30	-35%	25	25%
York Road 30	70	10%	70	15%	15	20%	20	20%
Brock Road/Hwy 7	-280	-45%	-185	-35%	165	220%	220	220%

Note:

Base Condition -Based on 1998 a.m. peak hour volume projections

[1] - Based on 1998 a.m. peak hour volume projections

[2] - % Increase/decrease in traffic between Base Condition and extension alternative

HIGHWAY 407 / TRANSITWAY
MARKHAM ROAD EASTERLY TO
HIGHWAY 7 EAST OF BROCK ROAD

COMMUNITY TRAFFIC IMPACTS

EXHIBIT
6

- Design, construction, operation and maintenance of full interchanges at Markham Road, the 9th Line, Markham Bypass, the Durham-York Line (Regional Road 30), and Brock Road;
- Design, construction, operation and maintenance of two interchanges between the Durham-York Line and Brock Road at specific locations to be determined at a later date as part of the Seaton planning process (See Chapter 4 of the EA Report for a description of the Seaton development proposal);
- Design, construction, operation and maintenance of a realignment of Highway 7 and 11th Line at the Durham-York Line to allow for the Highway 407 interchange;
- Design, construction, operation and maintenance of a connection to Highway 7, east of Brougham permitting access to and from both the east and the west;
- Design, construction, operation and maintenance of grade separations at 10th Line in Markham, and North Road, Sideline 24 and Sideline 16 in Pickering, and the CPR Havelock Subdivision west of the Little Rouge Creek;
- Closure of all north-south roads crossed by Highway 407/transitway where interchanges or grade separations have not been indicated; and
- Acquisition of property for, and construction of the ultimate Highway 407/Transitway and associated features, which may include but are not limited to: stormwater management facilities; temporary construction easements; access roads; and mitigation/compensation measures.

Approval of the undertaking by the Minister of Environment and Energy will allow the Ministry of Transportation (MTO) or its agent to:

- refine the alignment and property requirements for the

- undertaking during the design phase;
- file a designation plan for the undertaking;
- acquire property necessary for implementation of the undertaking; and
- design, construct, operate and maintain the completed highway and transitway, and the associated features.

Implementation of the undertaking will take place over a number of years and reflect financial conditions and traffic/transit demands. It is likely that the implementation of the project will be staged. This staging may include:

- Phasing of the ultimate basic 10 lane highway cross section to respond to traffic demands. Initial construction could consist of 2 basic lanes per direction, plus auxiliary lanes where required. The additional lanes would be added as traffic demands grow and downstream roadway capacity to handle the added traffic is in place.
- Opening of the highway to traffic as sections become available for use.
- Staging of some interchanges and grade separations with at grade intersections initially.
- Staging of interchange ramps to provide for moves restricted to certain directions initially with others being added when traffic demands/network development warrant.
- Provision of an interim connection at Highway 7 east of Brock Road
- Construction of a Transitway in a separate corridor adjacent to Highway 407.

It is important to note that mitigating measures will be planned and designed on the basis of the ultimate facility. However, the implementation of mitigating measures may also be phased in accordance with the impacts associated with each phase of implementation.

Note: The approval being sought by this EA, and the commitments made in this EA, will apply to and be

binding upon the Ministry of Transportation, its agents, successors, transfers and/or assigns, and will be applicable to the design, construction, operation and maintenance of the undertaking.

I. SUMMARY OF CONCERNS AND COMMITMENTS

Throughout the planning of this undertaking, the Project Team sought to identify areas of environmental concern and to identify a route that was sensitive to these concerns. With a project of this nature, it is not possible to avoid all environmental impacts. Therefore, it will be important that during the design phase, measures are developed to further reduce unavoidable impacts. A key component of this effort to reduce environmental impacts is the *Stakeholder Consultation Process* that was developed with extensive input by the stakeholder agencies. It was also reviewed with the public and interest groups at the last round of public consultation sessions.

The design team will meet with the stakeholders on a regular basis during the design and construction phase. A schedule of meetings will be established at the outset of consultation to ensure that stakeholders can effectively schedule their participation. As well, all meetings will be documented.

To keep the public informed through the design phase and to allow for public input, two public consultation sessions will be held during the design phase. In addition, public notification of the commencement of construction will be provided.

Specific commitments to environmental protection measures, ongoing consultation and follow-up monitoring will be documented in "Design and Construction Reports" and made available to the

stakeholders for review and comment prior to the commencement of construction.

During the consultation phase of this study, numerous specific commitments were made to ensure that environmental and cultural resources are protected. These commitments are detailed in Chapter 6 of the EA Report and summarized in Table 6.6.1 - **A Summary of Concerns/Potential Effects/ Proposed Mitigating Measures and Commitments to Further Work.**

Table 6.6.1 documents the specific environmental concerns, who raised the concern, what the potential effect could be, and how these effects will be addressed. It should be read in conjunction with the 1:10,000 Plates illustrating the undertaking - also provided in Chapter 6. The commitments that apply to the entire route are attached to this summary.

J. CONCLUSION

Traffic studies demonstrate that there will be serious traffic problems on the area road network east of Markham Road and in communities to the east when Highway 407 opens at Markham Road without an easterly extension of Highway 407. Furthermore, studies show that there is a significant shortfall in east-west transportation capacity in the Highway 7 corridor and across the Durham-York boundary.

An extension of Highway 407 and a Transitway is needed to address these immediate and longer-term transportation problems.

The analysis shows that this extension must go as far east as Highway 7 east of Brock Road to minimize traffic impacts on the local communities.

The proposed route has been selected from a number of alternatives, giving consideration to a broad range of environmental, social, cultural, economic and transportation concerns. As well, the affected government agencies, municipalities, interest groups and public have been involved throughout the study. This involvement has resulted in ongoing refinements to the project.

The Stakeholder Consultation Process to be implemented as part of the design and construction phase is unique and will ensure that stakeholders have the opportunity to work with the design team to address site specific environmental concerns. This will ensure that the project is implemented in a way that is sensitive to the environment, and public and agency concerns.

**SUMMARY OF CONCERNS/POTENTIAL ENVIRONMENTAL EFFECTS/ PROPOSED
MITIGATING MEASURES AND COMMITMENTS TO FURTHER WORK**

Table 6.6.1 in the EA report provides a summary of: environmental issues/concerns; the concerned external interests that identified the issues; the potential environmental effects of the undertaking; the proposed mitigating measure; the commitments to future work; and where in the EA Report further discussion of the mitigating measure can be found.

Steps taken during the design stage of the project to address and finalize environmental commitments will be documented in "Design and Construction" reports which will be available to stakeholder agencies for information and monitoring purposes prior to construction.

The following summarizes the commitments that apply to the entire undertaking. The reader should refer to the complete Table in Chapter 6 of the EA, for the site specific commitments.

In Table 6.6.1, the following shortforms apply:

MNR	- Ministry of Natural Resources	DFO	- Department of Fisheries and Oceans
MOEE	- Ministry of Environment and Energy	DOE	- Environment Canada
MTRC	- Metro Toronto Region Conservation	MCzCR	- Ministry of Citizenship, Culture and Communications
RPA	- Rouge Park Alliance	LACAC	-Local Architectural Conservation Advisory Committee
SCP	- Stakeholder Consultation Process		

NOTE: Reference in this Table to the impacts of culverts is intended to make the reader aware of the potential for the use of culverts at some crossings. However, as stated throughout this EA, the actual type of crossing to be employed will not be determined until the design stage, and will be done in consultation with the affected stakeholders.

TABLE 6.6.1

SUMMARY OF CONCERNS/POTENTIAL EFFECTS/PROPOSED MITIGATING MEASURES AND COMMITMENTS TO FURTHER WORK

Location	Environmental Issues/ Concerns	Concerned Group/Agency	Potential Environmental Effects of the Undertaking	Proposed Mitigating Measures, Commitments to Further Work	Comments
Entire Route	Upstream flood levels and downstream erosion at watercrossing.	MNR, MTRC, MOEE, RPA, Municipality, Public	Restriction of the valley could cause increased flood levels upstream, and increased water velocity resulting in downstream erosion.	A drainage analysis will be carried out to ensure that crossings are designed to minimize erosion and flood risk.	See Section 6.4.1
	Runoff impacts on watercourses	MNR, MOEE, MTRC, RPA, Municipality, DFO, DOE, Interest Groups, Public	Stormwater runoff can adversely affect water quality, fish habitat and stream erosion.	Stormwater management plan will be developed. Erosion control plan will be developed.	See Section 6.4.1
	Archaeological sites	MCzCR, LACAC, Municipality	Loss of archaeological resources.	Pre-construction archaeological surveys and mitigation will be done in consultation with Heritage agencies.	See Section 6.4.3
	Fish habitat	MNR, MTRC, RPA, DFO, DOE, Interest Groups, Public	Harmful alteration of fish habitat.	Stream assessment and crossing design in accordance with SCP. Compensation plans in accordance with Fisheries Act.	See Sections 6.3.2 & 6.4.1
	Groundwater upwelling areas	MNR, MOEE, MTRC, DFO, DOE	Culverts can interfere with upwelling areas adversely affecting baseflows to coldwater streams.	Open-bottomed culverts/bridges will be considered in upwelling areas.	See Section 6.4.1

TABLE 6.6.1

SUMMARY OF CONCERNS/POTENTIAL EFFECTS/PROPOSED MITIGATING MEASURES AND COMMITMENTS TO FURTHER WORK

Location	Environmental Issues/ Concerns	Concerned Group/Agency	Potential Environmental Effects of the Undertaking	Proposed Mitigating Measures, Commitments to Further Work	Comments
Entire Route	Spills	MOEE, MNR, MTRC, RPA, DFO, DOE, Interest Groups, Public	Spills can cause adverse effects on surface and ground water and soils.	Ease of containment of spills at stormwater management facilities will be reviewed during design.	See Section 6.4.1
	Contaminated sites	MOEE	Unknown contaminated sites may be encountered during design or construction.	A Phase 1 assessment of property is currently underway. Sites will be managed in accordance with MOEE's decommissioning guidelines.	See Section 6.4.1
	Noise	MOEE, Municipality, Public	Increased noise	Detailed noise studies will be carried out during design phase and appropriate mitigating measures will be determined.	See Section 6.4.2
	Agricultural land	OMAFRA, Public	Loss of prime agricultural land.	Impact reduced through planning. Opportunities for further reduction will be considered during design	See Section 6.4.4
	Impacts on wells/septic systems	MOEE, Municipality, Public	Reduction in supply. Impacts on quality and quantity of groundwater. Possible pathway to aquifers if not properly abandoned.	Contractor will be responsible for correcting impacts resulting from construction. Wells and septic systems removed from service will be properly abandoned/ decommissioned.	See Section 6.4.1
	Impacts on groundwater recharge areas.	MOEE, MNR, MTRC, Municipality, DFO, DOE	Roadway runoff and spills can adversely affect groundwater quality.	Stormwater management plans will be developed to minimize the effects of stormwater. (See spills.)	See Section 6.4.1

CHAPTER 1

INTRODUCTION AND BACKGROUND

1.0 INTRODUCTION AND BACKGROUND

1.1 INTRODUCTION

This Environmental Assessment Report (EAR) is for the extension of the Highway 407/transitway from Markham Road easterly to Highway 7 east of Brock Road. Highway 407 was initially considered during the 1940s and 1950s and, since that time, has been incorporated into the planning of all major transportation and land use decisions, for what is now known as the Greater Toronto Area (GTA). Construction of parts of Highway 407 between Highway 403 in Peel Region and Markham Road in York Region, was initiated during the 1980s, and is ongoing with planned completion in 1998. This portion of Highway 407 was protected as part of the Parkway Belt West Plan¹, and was carried out in accordance with provisions of the Environmental Assessment Act.

The planning of the Highway 407/Transitway Transportation Corridor east of Markham Road was begun in 1989 and has been carried out in 3 phases. These study phases are illustrated in Figure 1.1 and briefly described below. The phases are discussed in more detail in Chapters 2 and 5. Exhibit 1.1 shows the regional context of the Highway 407 and the relationship of its various components.

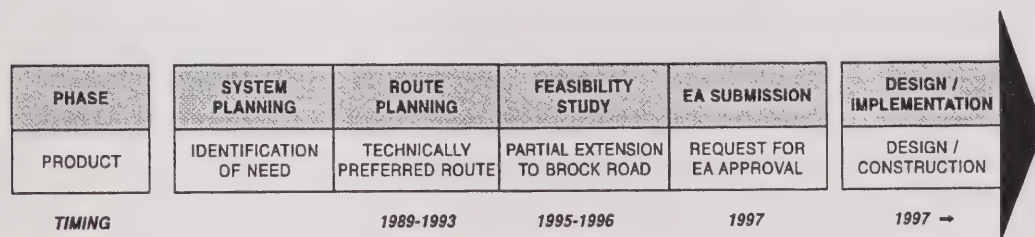


Figure 1.1
Highway 407/Transitway Study Phases

The need for a continuation of Highway 407 with a Transitway component was determined through a system planning study completed in 1989. This Highway 407 **Overview Study** assessed the traffic demands in the Greater Toronto Area and surrounding municipalities and concluded that there was a need to continue Highway 407 easterly from Markham Road to Highway 35/115 to address deficiencies in meeting east-west travel demands. These deficiencies are discussed in detail in Chapter 2 of this report. The Overview Study recommended that to protect for future transportation corridors, the following actions be taken:

- protection of property for the freeway network by carrying out the necessary route location and environmental assessment studies;
- route location and environmental assessment studies be carried out for the recommended road improvements; and
- protection for the transit network.

¹ The Parkway Belt West Plan was approved by Order-in-Council 2188/78 on July 19, 1978.



On the basis of this system planning study, the Ministry of Transportation proceeded with the planning for a Highway 407/Transitway Transportation corridor from Markham Road to Highway 35/115. At that time, the Ministry had anticipated an ongoing construction program that would meet the traffic demand without adversely affecting the local road system. The **Route Planning Study** comprised the following sub-phases:

- inventory and assessment of existing conditions;
- identification of evaluation criteria;
- generation and comparative evaluation of route alternatives and selection of the Technically Preferred Route; and
- modifications/refinements to the Technically Preferred Route.

A technically preferred route for the Highway 407/Transitway Transportation Corridor was identified through this Route Planning Study in 1993. Preliminary design and EA submission were to follow. However, in the early 1990's the construction of Highway 407 from Highway 403 in the City of Mississauga to Markham Road in the Town of Markham, was accelerated when the Province announced a contract to develop, design and build Highway 407. Under this accelerated program, Highway 407 is scheduled to open to Markham Road by 1998. Traffic analysis (see Chapter 2) demonstrates that the opening of Highway 407 to Markham Road in the absence of an extension easterly, will result in significant traffic related impacts in the Town of Markham.

A program was underway to complete the planning, design, and Environmental Assessment Act approval requirements for the 65 km long extension of Highway 407 from Markham Road to Highway 35/115. However, with the acceleration of the construction program for Highway 407 west of Markham Road, the planned approach would not have allowed the construction of Highway 407 immediately east of Markham Road in time to address potential traffic problems in the Markham area due to the temporary termination of Highway 407 at Markham Road.

In 1995, in anticipation of traffic impacts resulting from a temporary termination of Highway 407 at Markham Road, and in response to concerns expressed by the Town of Markham and the Regional Municipality of York, the Ministry of Transportation initiated a **Feasibility Study** of ways of addressing traffic concerns related to the potential 1998 Highway 407 opening. The Feasibility Study comprised the following sub-phases:

- quantification of the problem;
- development of staging alternatives;
- identification of federal and provincial approval requirements and alternative processes for obtaining approvals;
- consultation with technical agencies and municipalities;
- analysis of alternatives - including detailed traffic analysis, assessment of technical feasibility and identification of impacts of each alternative;
- analysis of financial feasibility;
- further consultation with municipalities and the public;
- evaluation and selection of the preferred solution, and the preferred environmental assessment approvals process; and

- development of the Stakeholder Consultation Process to be followed during the design and construction phase to address environmental issues.

A premise of the Feasibility Study was that an immediate extension of Highway 407 east of Markham Road to address the traffic problems would follow the Technically Preferred Route determined by the earlier Route Planning Study. This Feasibility Study:

- confirmed that the termination of Hwy 407 at Markham Road would cause significant traffic impacts to local roads and communities;
- reaffirmed that there exists a significant transportation capacity deficiency across the York/Durham boundary; and
- concluded that a partial extension of Highway 407 from Markham Road easterly to Highway 7 east of Brock Road, following the technically preferred route determined through the Route Planning Study, was the best alternative.

The result of the planning work leading to the recommendation that Highway 407/Transitway be extended from Markham Road easterly to Highway 7, east of Brock Road was documented in a draft Environmental Assessment Report (EAR). A draft of the EAR was distributed to the government reviewers in December 1996 for pre-submission review. Comments that were received were incorporated into the final EAR and are summarized in Appendix 24. The final EAR was submitted to the Minister of Environment and Energy in support of a request for approval of the undertaking under the Environmental Assessment Act (EA Act). The Ministry of Environment and Energy will coordinate the formal review and approval process in accordance with the requirements of the EA Act.

This Environmental Assessment (EA) Report documents the complete planning process leading to the selection of the recommended alternative (the Undertaking). Specifically the EAR is structured as follows:

- Chapter 1: Introduction and Background - Describes the undertaking, provides an historical perspective to the undertaking, explains the selection of the Study Area, describes the study organization, and describes the presubmission consultation process.
- Chapter 2: Problem and Opportunities - Describes the transportation problems east of Markham Road.
- Chapter 3: Alternatives to the Undertaking - Describes the process of identifying and analyzing alternatives to the undertaking.
- Chapter 4: Existing Conditions - Describes the existing conditions within the Study Area.

- Chapter 5: Route Planning Alternatives - Describes the process of identifying and analyzing route alternatives, leading to the selection of a technically preferred route.
- Chapter 6: Description of the Undertaking and Future Work - Describes the features of the undertaking, the potential environmental effects of the undertaking and the measures proposed for minimizing these effects.

1.2 APPROVAL BEING SOUGHT

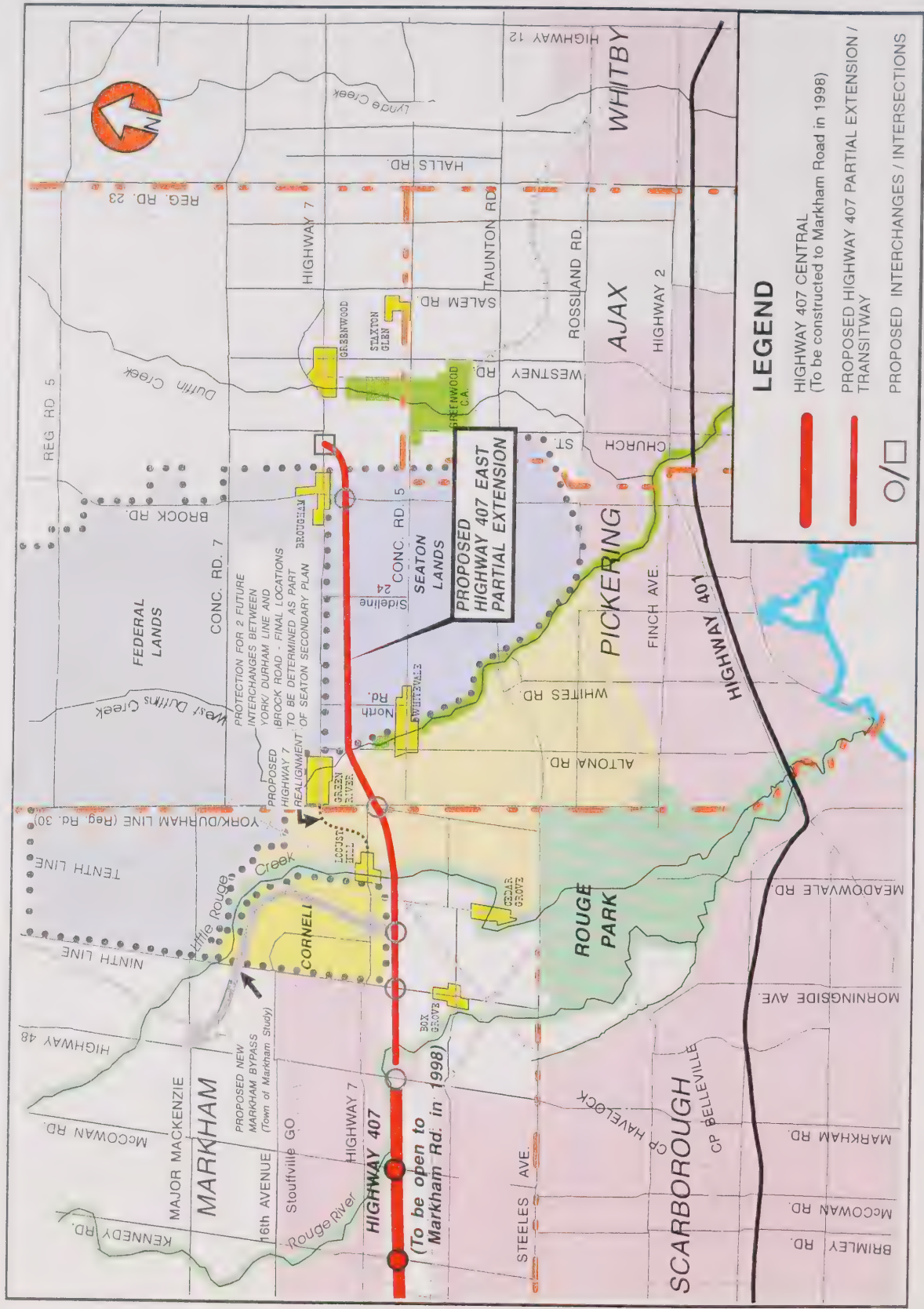
In 1997, the Environmental Assessment Act was amended. The Ministry of Transportation is submitting this environmental assessment (EA) for Highway 407/Transitway, Markham Road Easterly to Highway 7 East of Brock Road in accordance with the transition provisions of the amended Environmental Assessment Act. As such, MTO has requested to have Part II of the previous EA Act, and the provisions of Part II of the new Act with respect to mediation, if these are required, and the Section 12.2 activities permitted before approval, to apply to this EA.

This Environmental Assessment Report documents the planning process, its conclusions and the rationale for the undertaking. This report is structured to reflect the requirements of the **Environmental Assessment Act, R.S.O. 1990**, and to provide an understanding of the decision-making process. The report contains the following:

- the purpose of the undertaking (Chapter 2);
- the environmental assessment process followed (Chapter 1);
- the environmental conditions in the study area (Chapter 4);
- the alternatives considered (Chapters 3 & 5);
- an assessment of the environmental effects associated with the undertaking and the reasonable alternatives (Chapters 3, 5 & 6);
- the rationale for and description of the recommended alternative (Chapters 5 & 6);
- the commitment to further work to be undertaken relative to identified "environmentally significant areas/issues", and actions to address environmental effects (Chapter 6); and
- the process for addressing new concerns (Chapter 6).

The location of the undertaking for which approval is being sought is illustrated in Exhibit 1.2 and includes:

- Construction, operation and maintenance of a freeway (up to 10 basic lanes) with a basic minimum 100m right-of-way from Markham Road easterly to Highway 7 east of Brock Road;
- Construction, operation and maintenance of a transitway with a basic minimum 60 metre right-of-way from Markham Road easterly to Highway 7 east of Brock Road;
- Construction of full interchanges at Markham Road, the 9th Line, Markham Bypass, the Durham-York Line (Regional Road 30), and Brock Road;



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MARKHAM ROAD EASTERLY TO
HIGHWAY 7 EAST OF BROCK ROAD

THE UNDERTAKING

- Construction of two interchanges between the Durham-York Line and Brock Road at specific locations to be determined at a later date as part of the Seaton planning process (See Section 4.5.1 for a description of the Seaton development proposal);
- Construction of a realignment of Highway 7 and 11th Line at the Durham-York Line to allow for the interchange;
- Construction of a connection to Highway 7, east of Brougham permitting access to and from both the east and the west;
- Construction of grade separations at 10th Line in Markham, and North Road, Sideline 24 and Sideline 16 in Pickering; and
- Acquisition of property for, and construction of the ultimate Highway 407/Transitway and associated features, which may include but are not limited to: stormwater management facilities; temporary construction easements; mitigation/compensation measures; and access roads..

Approval of the undertaking by the Minister of Environment and Energy will allow the Ministry of Transportation (MTO) or its agent to:

- refine the alignment and property requirements for the undertaking during the design phase;
- file a designation plan for the undertaking;
- acquire property necessary for implementation of the undertaking; and
- design, construct, operate and maintain the completed highway and transitway.

Implementation of the undertaking will take place over a number of years and reflect financial constraints and traffic/transit demands. It is likely that the implementation of the project will be staged. This staging may include:

- Phasing of the ultimate 10 basic lane highway cross section to respond to traffic demands. Initial construction could consist of 2 basic lanes per direction, plus auxiliary lanes where required. The additional lanes would be added as traffic demands grow and downstream roadway capacity to handle the added traffic is in place.
- Opening of the highway to traffic as sections become available for use.
- Staging of some interchanges and grade separations with at grade intersections initially.
- Staging of interchange ramps to provide for moves restricted to certain directions initially with others being added when traffic demands/network development warrant.
- Provision of an interim connection at Highway 7 east of Brock Road.
- Construction of a Transitway in a separate corridor adjacent to Highway 407.

Note: The approval being sought by this EA, and the commitments made in this EA, will apply to and be binding upon the Ministry of Transportation, its agents, successors, transfers and/or assigns, and will be applicable to the design, construction, operation and maintenance of the undertaking.

1.3 COMMITMENTS TO FUTURE WORK

Throughout the study process of external team contacts, internal meetings, and the organized public participation program, concerns raised by any of these groups that required further work were documented. These commitments are discussed in Chapter 6 and summarized in Table 6.6.1. Many of these commitments will be appropriately addressed during the design phase when mitigating measures are finalized. The following discusses the design phase and the commitment to consultation during the design and construction, development and implementation of measures to address unacceptable adverse effects and the importance of monitoring.

1.3.1 The Design Phase

The Design Phase generally includes the preparation of plans, profiles and cross-sections for the recommended route, including details of the roadway, transitway, structures and interchanges.

More specifically, this phase will include the following:

- Further investigation of environmental and engineering matters as required;
- Finalization of design criteria for roads, transitway, and structures;
- Preparation of design plans, profiles, and cross-sections with details of alignments, interchange configurations, medians and property requirements;
- Design of mitigation measures;
- Preparation of general arrangement plans and structural design plans for all structures;
- Preparation of detailed Stormwater Management Plans including; hydrology studies to determine appropriate water crossing structure and culvert details;
- Preparation of landscape plans;
- Preparation of utility relocation plans;
- Preparation of detailed cost estimates;
- Development of construction staging strategy;
- Finalization of measures to mitigate potential adverse environmental condition changes, and commitments to related future investigations, monitoring, external liaison, and documentation;
- Preparation of Design and Construction Reports;
- Preparation of CEAA screening reports and obtaining appropriate Federal Approvals;
- Consideration of traffic engineering functions such as Advanced Traffic Management Systems (ATMS), illumination and traffic control devices; and
- Review of corridor control aspects, such as road closings, transfers and assumptions.

During the design phase ongoing consultation will be held to ensure that environmental concerns are properly addressed. A Stakeholder Consultation Process for the design and implementation phase has been developed through extensive consultation with affected agencies. This process is described in Chapter 6. The techniques for mitigating environmental concerns will be further

refined through the Stakeholder Consultation Process and documented in "Design and Construction" reports. These "Design and Construction" reports will be forwarded to the appropriate agencies and other external contacts as necessary for information and monitoring purposes.

1.3.2 Mitigation During Construction

Based upon the design, construction documents will be prepared to guide the construction process. These construction documents will confirm mitigation agreements reached during the presubmission consultation process and the Stakeholder Consultation Process.

As part of MTO's commitment to reducing the adverse effects of its projects, the Ministry has developed a range of proven approaches to address the typical impacts encountered during the construction of transportation facilities. These mitigating measures are reflected in contracts in one or more of the following ways:

- as standard specifications for Ontario projects in general (Ontario Provincial Standard Specifications/OPSS);
- standard for MTO projects (special provisions/SP), or
- developed on a project-specific basis (non-standard special provisions/NSSP) including operational constraints.

SPs are used to implement legislative requirements which apply to MTO, or administrative agreements/ protocols negotiated with other agencies. NSSPs are needed to define site-specific mitigation where a suitable OPSS or SP is not available, or requires additional detail.

These proven approaches will guide MTO or its agent during the construction of the Highway 407/Transitway.

1.3.3 Monitoring

Projects are monitored formally and informally as appropriate during construction, operation and maintenance. Prior to the construction phase of a project MTO or its agent may collect baseline technical information required for its environmental monitoring program. During construction, MTO or its agent ensures that implementation of mitigating measures and key design features is consistent with the contract and external commitments. In addition, MTO assesses the effectiveness of its environmental mitigating measures to ensure the following:

- individual and combined mitigating measures are providing the expected control and/or protection;
- additional mitigating measures are provided, as required, for any unanticipated environmental problems which may develop during construction;
- information is available for the overview assessment of mitigating measures

Environmental monitoring after a project is completed may involve follow-up monitoring of significant measures and/or significant concerns.

During the design phase, monitoring programs will be discussed with affected agencies as part of the Stakeholder Consultation Process. These discussions will include the establishment of working relationships between the proponent and affected agencies for ratification procedures for construction activities, and site inspection and reporting procedures. The monitoring programs established will include monitoring for compliance with the commitments to further work: made in this Environmental Assessment; required as part of any conditions of approval of the undertaking, should approval of the undertaking ultimately be given; and arising from the Stakeholder Consultation Process.

During construction, MTO or its agent ensures that external notifications and consultations are consistent with any commitments which may have been made earlier. Following construction, monitoring will ensure that any follow-up information is provided to external agencies as per any outstanding environmental commitments.

1.3.4 Canadian Environmental Assessment Act

This portion of Highway 407 has the potential requirement for 3 types of federal authorizations that would trigger the Canadian Environmental Assessment Act (CEAA). The authorizations relate to the Navigable Waters Protection Act approval for the Rouge River Crossing, a potential Canadian Transportation Act approval for the crossing of the CPR railway line, and potential authorizations under the Fisheries Act for stream crossings. These authorizations which can only be obtained after receiving CEAA approval, are discussed in more detail in Chapter 6.

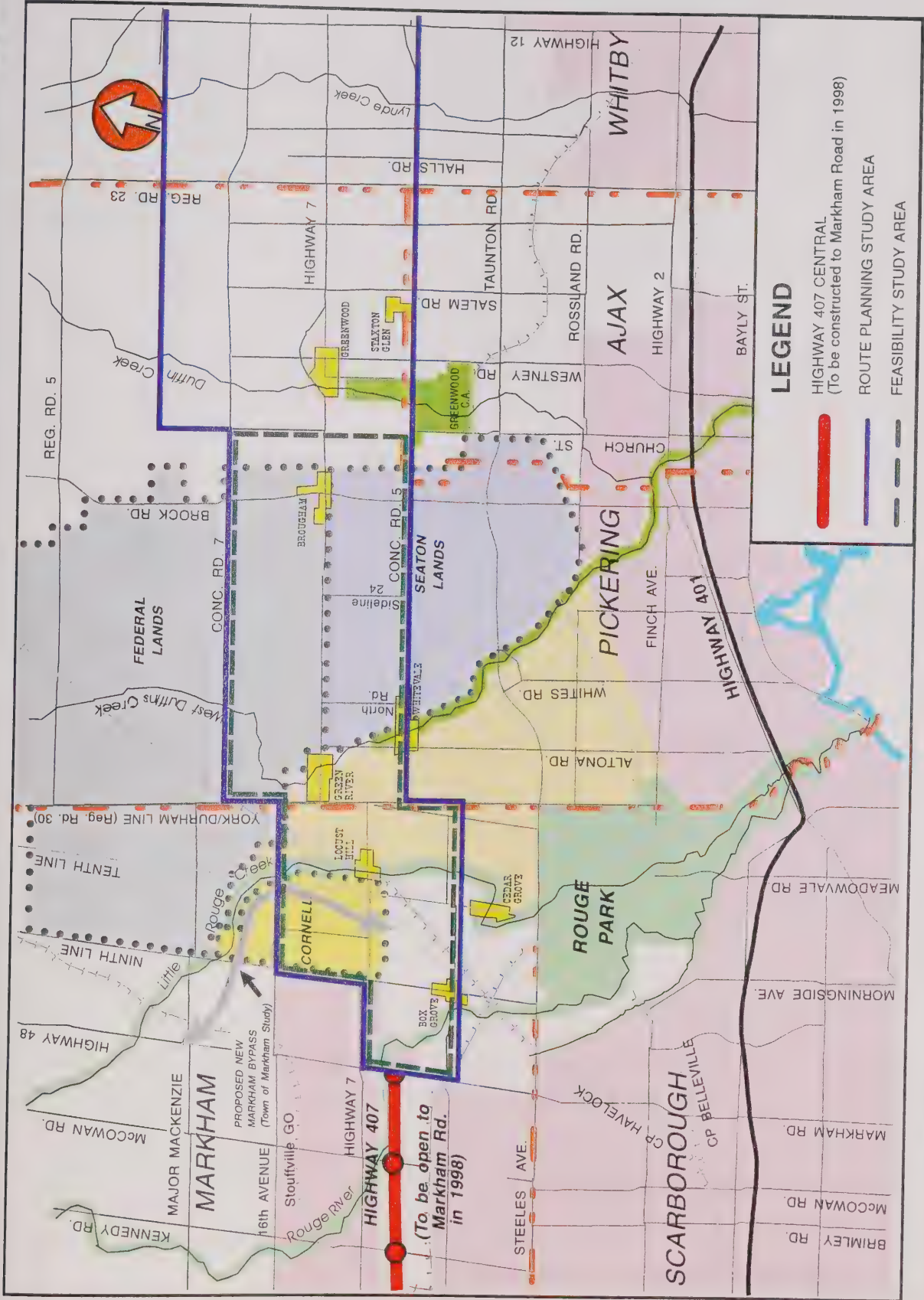
1.4 STUDY AREA

The Study Area has varied in size during the course of the work leading to the selection of the undertaking. For the purposes of the system planning phase the study area was the Greater Toronto Area (GTA) and surrounding regions.

The study area for the Route Planning Study covered approximately 13,740 ha (1,374 km²) (see Exhibit 1.3), within the Regions of York and Durham.

Several considerations went into the selection of the Route Planning study area. These included:

- the study area was based on the recommended freeway network identified in the Highway 407 Overview Study;
- at the west end, the study area excludes the built-up, established portion of the former Village of Markham as well as large tracts of land south of Fourteenth Avenue which, although vacant at the time of the study, contained major trunk services in anticipation of imminent residential development;



HIGHWAY 407 / TRANSITWAY
MARKHAM ROAD EASTERLY TO
HIGHWAY 7 EAST OF BROCK ROAD

STUDY AREA

EXHIBIT
1.3

- the northern limit of the study area was also established, in part, by the need identified in the Highway 407 Overview Study to serve demonstrated east-west travel demand and maintain conventional GTA freeway network spacing (8-10 km) in the Regions of York and Durham based on serving future population and employment nodes proposed by the regional municipalities;
- the selection of the study area was influenced by the local environmental sensitivities, and comments received during the consultation process;
- to complement the plans for the Seaton Community, a Highway 407 corridor located between Highway 7 and mid-concession 5 in Pickering was considered desirable, whereas a corridor through the south-central part of Seaton was not considered compatible with the envisaged community development; and
- to provide a freeway facility that would not preclude direct access to the Pickering Airport Site; the Highway 407 corridor needed to be located in close proximity to existing Highway 7.

The Study Area for the Feasibility Study covers approximately 6875 ha (68.75 km²), comprising that portion of the Route Planning Study Area between Markham Road and Sideline 14 in the Town of Pickering. Much of the study area comprises lands assembled by the Federal and Provincial Governments for the Pickering Airport Site, the Cornell Development and the North Pickering Project. For the purposes of the transportation analysis, a transportation study area was defined which covers an area bounded by McCowan Road, Elgin Mills Road, Lake Ontario and east of Brock Road.

A secondary area including the Greater Toronto Area (GTA) and adjacent municipalities was also established to ensure that an "area wide" perspective of transportation opportunities was considered.

Unless otherwise stated, the term "Study Area" used throughout this report refers to the Study Area for the Feasibility Study.

1.5 STUDY ORGANIZATION

When carrying out of a major transportation planning study of this nature an effective study organization is needed to ensure that the following objectives are met:

- to ensure that stakeholders have the opportunity to be involved in the study;
- to identify issues and interests early enough in the planning process so that they can be effectively addressed;
- to allow the various interests within the Ministry of Transportation to participate effectively in the study;
- to effectively draw on the skills and knowledge base of the broad community to facilitate decision-making;

- to properly quantify the problems/opportunities within the study area;
- to generate a reasonable range of alternatives for addressing the problems/opportunities; and
- to properly assess the potential impacts, evaluate the alternatives, and develop mitigating measures.

The study organization is illustrated in Exhibit 1.4 and described below.

1.5.1 Project Team

The Project Team included the Project Director, Project Manager and Environmental Planner from the Ministry of Transportation, and the Project Director and senior representatives from the Consultant Team carrying out the project planning. This team provided ongoing guidance to the project. Several consulting firms have participated in the various phases of the study. The Overview Study was completed by Proctor and Redfern Limited. The Route Planning Study for the section between Markham Road and the Whitby/Oshawa Boundary was largely carried out by Fenco-MacLaren Limited, with the balance out to Highway 35/115 by C.C. Parker Consultants Ltd. The Feasibility Study and preparation of the EA was carried out by McCormick Rankin, Totten Sims Hubicki Associates, and Ecoplans Limited. Other specialist consultants were also involved at key points in the study. These firms are acknowledged in the relevant section of Chapter 4.

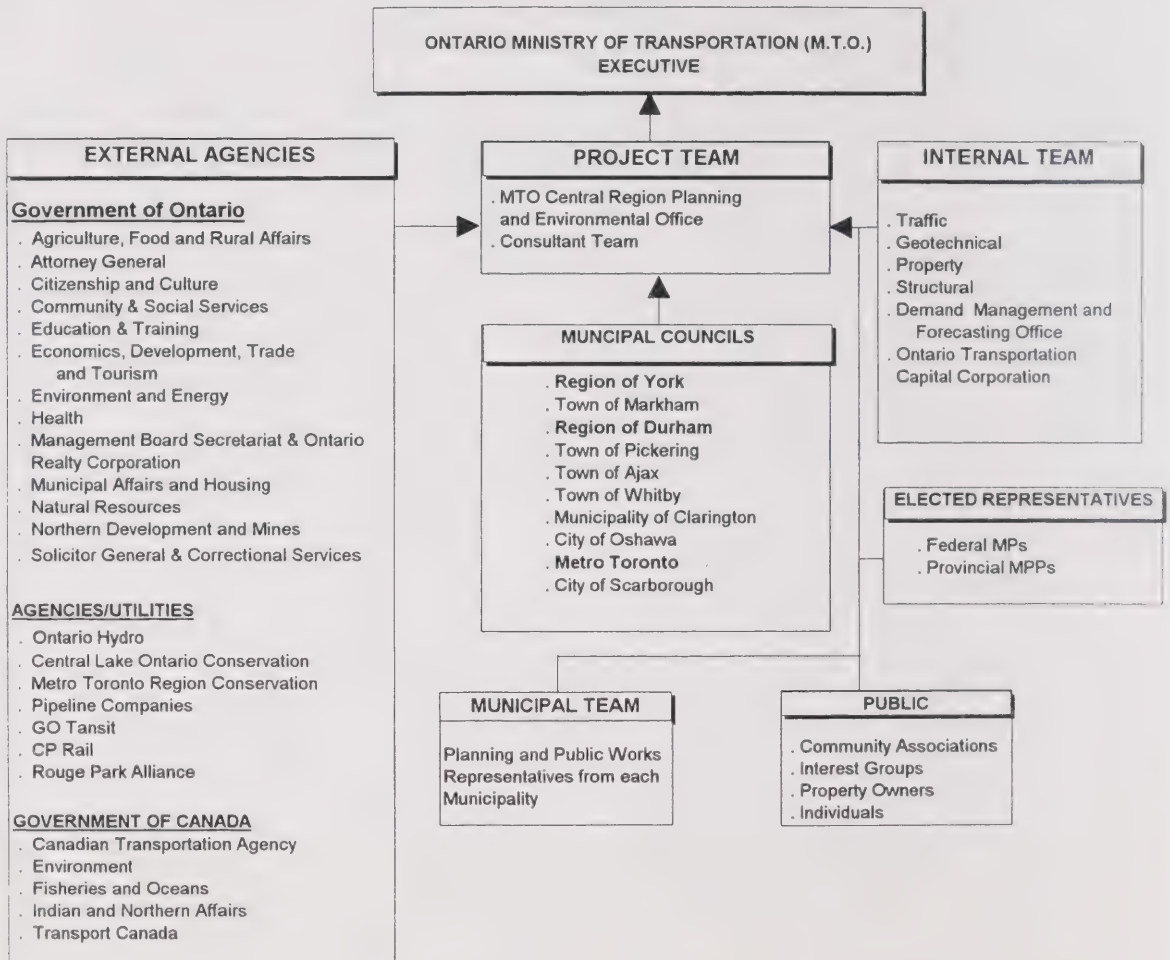
1.5.2 Internal Team

The Internal Team provided input on various matters to assist the Project Team during the course of the study. The Internal Team included representatives from senior management and specialist offices within MTO's Head Office and Central Region Office. Internal Team members were kept informed of the status of the project and were invited to provide input/comments specifically in conjunction with the public consultation program throughout the study. Once it was decided that there was the potential that the Highway 407/Transitway could be constructed through a design/build partnership, the Ontario Transportation Capital Corporation (OTCC) was added to the Internal Team.

1.5.3 External Team

All federal and provincial ministries and agencies who have the responsibility for review and comment on Environmental Assessments were organized into an External Team. Contact was made with members of the External Team at key points throughout the study. Some of the External Team ministries were contacted directly and/or participated at working meetings to resolve specific project related concerns that arose either at meetings or through written correspondence.

STUDY ORGANIZATION



NOTE: Includes contacts made during the Route Planning Study

EXHIBIT 1.4

1.5.4 Municipal Team

Planning and Public Works staff from the affected Municipalities were kept involved throughout the study and were invited to provide formal input at key points in the study. Elected municipal representatives were kept fully informed of the status of the project through presentations to municipal councils either by MTO representatives or municipal staff.

1.5.5 Members of Parliament

Local members of the federal and provincial parliaments were kept advised of the progress of the project throughout its history.

1.5.6 Land Owners, Special Interest Groups and the Public

To ensure that affected landowners, special interest groups and the general public had the opportunity to participate in the study, public consultation sessions were held at key points throughout the planning and decision-making process. In addition, individual meetings were held with landowners and special interest groups as needed during the study. The specifics of the consultation process are discussed in more detail in the next section.

1.6 PRESUBMISSION CONSULTATION PROCESS

Consultation with the review ministries and agencies, municipalities, elected representatives, landowners, special interest groups and the public has been a key component of all phases of this study, and has assisted the study team in:

- identifying relevant concerns of the various parties so that appropriate consideration could be given to these matters as decisions and commitments were made relative to the preferred planning solution or specific design proposals;
- identifying environmentally significant areas/issues;
- ensuring that all reasonable/feasible alignment alternatives were identified;
- ensuring that appropriate mitigating measures are identified and considered to minimize potential adverse effects; and
- ensuring that any commitments to future work are clearly outlined and documented.

Generally, the presubmission consultation program included the following:

- notification of study start-up, including a description of the study, and an outline of the study area;
- technical meetings and other contacts with municipalities, ministries and agencies, landowners, and special interest groups, as required; and
- Public Consultation Sessions and meetings with and/or presentations to municipalities and external ministries and agencies to present the progress of the study and to seek input. The need and opportunity for future meetings with

individuals or groups (such as property owners) who are directly affected by the preferred alternative have also been identified and such meetings will occur during future design phases to supplement those held during the planning phase.

Appendix 16 provides a chronological summary of input/comments received from External Team members during the course of the study, including dated references to associated correspondence which is located either in the Appendix 17 of this report or on file with MTO. The consultation process for the Route Planning Phase and the Feasibility Study are discussed below.

1.6.1 Route Planning Phase

Internal Involvement

The Internal Team (MTO personnel) provided input on various matters to assist the Project Team during the course of the study.

External Involvement

Contact with the members of the External Team and the Municipal Team was made formally at key points in the study often coinciding with the Public Information Centres, but also through working meetings and written correspondence.

Elected municipal representatives were kept fully informed of the status of the project through presentations to municipal councils.

During the Route Planning Phase of the study, External Team presentations were held in conjunction with the May 1990 and June 1991 Public Information Centres on the following dates:

- May 15, 1990 - presentation of Route Alternatives; and
- May 13, 1991 - presentation of Technically Preferred Route.

In addition, External Team representatives were consulted regarding:

- The April 1990 - Initial Data Collection, proposed Route Alternatives and proposed Evaluation Criteria;
- The July 1990 - proposed Route Alternative Modifications as a result of ministry/agency, municipal and public input received during the spring and early summer of 1990;
- The August 1991 - Technically Preferred Route; and
- The September 1992 - proposed minor alignment shift in the Town of Markham (Link S3S).

The Region of York and Region of Durham Municipal Technical Teams met separately and reviewed presentations from the Project Team on the following dates:

	<u>Region of York</u>	<u>Region of Durham</u>
Study Initiation	June 19, 1989	June 19, 1989
Initial Route Alternatives	November 28, 1989 March 2, 1990	November 27, 1989 February 18, 1990
Final Route Alternatives	October 5, 1990	October 15, 1990
Technically Prepared Route	May 10, 1991	May 8, 1991

Public and Special Interest Group Involvement

The general public and special interest groups were encouraged to participate in the study process through the project's organized consultation program.

The public consultation program consisted of the following:

- Newspaper notices (Ontario Government Notices);
- Production and distribution of Brochure No. 1 - Notice of Study Initiation/Data Collection in November 1989;
- Production and distribution of Brochure No. 2 - Notice of Public Information Centres - Alternative Routes (May 1990);
- First series of Public Information Centres (Alternative Routes) held in May 1990;
- Production and distribution of Brochure No. 3 - Notice of Public Information Centres - Presentation of Technically Preferred Route (May 1991);
- Second series of Public Information Centres (Technically Preferred Route) held in June 1991;
- Verbal and written responses to comments made at the information centres and to communications received throughout the course of the study; and
- Meetings with individuals or special interest groups as requested and deemed practical.

In addition, special interest groups were kept informed of the study process and provided input specific to their concerns at special preview sessions preceding each of the two Public Information Centres. Municipal council presentations also provided a forum for the public to obtain information on the project. The input received during this consultation led to the consideration and selection of a shift in the alignment to permit a more environmentally acceptable crossing of the Little Rouge Creek. This is discussed in more detail in Chapter 5.

Federal and Provincial Elected Representatives

Federal and provincial elected representatives within the study area were kept informed of the study process throughout the Route Planning Phase. Contact was made formally at key points in the study coinciding with the Public Information Centres. The following elected representatives were contacted:

MP Durham
MP Markham-Whitchurch-
Stouffville
MP Ontario
MP Scarborough-Rouge River
MP Scarborough East
MP Scarborough North

MPP Durham Centre
MPP Durham West
MPP Durham-York
MPP Markham

Input on the technically preferred route was obtained from Members of Provincial Parliament at a meeting held in June of 1991.

1.6.2 Feasibility Study

Internal Involvement

Throughout the Feasibility Study, the Internal Team provided input on various matters to assist the Project Team during the course of the study. The Internal Team included representatives from senior management and specialist offices within MTO's Head Office and Central Region Office.

External Involvement

During the course of developing the alternatives, meetings were held with technical agencies and municipalities. The purpose of the meetings was to introduce the study, outline the proposed study approach, collect background information, review the problem being addressed and identify the alternatives.

All federal and provincial ministries and agencies who have the responsibility for comment and review of Environmental Assessments were organized into an External Team. The agencies involved were essentially the same as those involved during the Route Planning study. Since in many cases the specific contact or the agency name had changed, copies of previous correspondence was provided to the new contact to ensure continuity of comments. Contact with the External Team was initiated through an introductory meeting held on January 25, 1996.

Follow-up correspondence and meetings were held with the External Team to address specific issues. During the study no concerns were raised about the study process nor the range of alternatives being considered.

Municipal staff were kept informed of the study through ongoing contact and meetings, including:

- February 13, 1996 - York Region
- February 13, 1996 - Town of Markham
- February 14, 1996 - Metropolitan Toronto
- February 21, 1996 - Durham Region
- February 22, 1996 - City of Scarborough
- February 23, 1996 - Town of Pickering
- October 4, 1996 - York Region
- October 4, 1996 - Durham Region/Town of Pickering

The analysis of the alternatives was reviewed with municipal staff and presented to municipal councils and the public at the following meetings:

- February 28, 1996 • Durham Council adopted a resolution encouraging the continued extension of Highway 407 beyond Markham Road
- March 25, 1996 • Staff representatives of affected municipalities
- March 25, 1996 • Municipal staff made a presentation to Scarborough's Works and Environment Committee about the Hwy 407 study and the up-coming public consultation sessions
- April 1, 1996 • MTO representatives made a presentation to Pickering Council
- April 1, 1996 • Pickering Council adopted a resolution supporting the concept of an extension of Highway 407.
- April 2, 1996 • Durham staff made a presentation to Durham Planning Committee
- April 2, 1996 • MTO representatives made a presentation to the Markham Planning Committee
- April 2, 1996 • Planning Committee provided support for extending Hwy 407 beyond Markham Road as soon as possible
- April 2, 1996 • Varying opinions expressed as to whether or not all moves at Markham Road/Highway 407 should be provided

- April 3, 1996
 - MTO representatives made a presentation to the York Transportation and Works Committee
 - The Committee endorsed the study process
- April 15, 1996
 - York Council adopted a report endorsing the process undertaken by MTO to address the traffic and environmental issues associated with the opening of Highway 407 to Markham Road.
- May 6, 1996
 - Pickering Council adopted a resolution supporting the ultimate extension of Highway 407 to Highway 35/115 and the interim extension to Highway 7 east of Brock Road.
- September 17, 1996
 - A presentation was made to Markham's Planning and Development Committee
- October 4, 1996
 - A presentation was made to staff of the Town of Pickering and the Regions of Durham and York
- October 8, 1996
 - Markham Council passed a resolution supporting the extension of Highway 407 to, at least the Markham By-pass at the earliest opportunity; and that the MTO work with the Town of Markham to mitigate the impacts of the interim termination of Highway 407 at Highway 48.
- October 29, 1996
 - Durham Council passed a resolution supporting MTO's decision to proceed with the Environmental Assessments for the interim and complete extension of Highway 407 easterly from Highway 48; and supporting the extension to Highway 7/Brock Road area.
- November 14, 1996
 - York Council passed a resolution supporting the Highway 407 Partial Extension Study, and the proposed process for fast-tracking the Environmental Assessment Study.

Staff of the Metropolitan Toronto Transportation Department advised that a presentation to council was not required.

Public and Special Interest Group Involvement

The following Public Consultation Sessions were held to provide an opportunity for the public, special interest groups, and External Team members to review and comment on the study findings.

DATE	LOCATION	INFORMATION PRESENTED	ATTENDANCE
April 3/96	Markham	<ul style="list-style-type: none">• Results of Route Planning Study• Projected Traffic Conditions with Termination of Hwy 407 at Markham Road• Existing Conditions in Study Area• Extension Options• Evaluation of Options	215
April 4/96	Pickering		100
Nov. 6/96	Markham	<ul style="list-style-type: none">• Summary of Study Phases Findings• Summary of Public Comments from Previous PCS• Preferred Alternative• Benefits & Effects of Undertaking• Stakeholder Consultation Process	142
Nov. 7/96	Pickering		131

At both meetings in Markham, most of the people expressed concerns with the possible termination of Highway 407 at Markham Road and increased traffic volumes through the village of "Old Markham", and supported the extension of Highway 407 to the Markham Bypass, as a minimum. As well, many people expressed concern for the impacts of the undertaking on agricultural lands and the natural systems in the study area.

Many of the people attending the Public Consultation Session in Pickering exhibited general recognition and/or acceptance of the extension of Highway 407 from Markham Road to Highway 35/115 due to their involvement in the earlier Route Planning Study and/or general public recognition of Highway 407. As a result, the main focus was on the status and timing of Highway 407 easterly to Highway 35/115, with many expressing the need for the Ministry to "get on with it" in order to end the general uncertainty in the area. There was much concern about existing levels of traffic through the hamlets and any potential increases. As was the case at the Markham Public Consultation Sessions, many people expressed concerns about the impacts of the undertaking on agricultural lands and the natural features within and adjacent to the study area.

A copy of the Ontario Government Notice and a summary of the Public Consultation Sessions are provided in Appendix 18.

In summary, the general public identified major concerns about the traffic impacts on the Town of Markham resulting from the termination of Highway 407 at Markham Road, strong support for extending Highway 407 easterly, and concern for protection of the valley systems being crossed by the highway/transitway.

Because of the special interest in the potential effects in the Rouge watershed, a presentation of the project background, alternatives under consideration and process for determining the preferred alternative, was made to the Rouge Park Alliance on May 15, 1996. The Rouge Park Alliance consists of representatives from the MTRC; the Ministry of Municipal Affairs and Housing; the Municipalities of Metropolitan Toronto, Markham, Scarborough, Pickering, Richmond Hill, Whitchurch-Stouffville; the Metro Zoo; and Save the Rouge Valley Systems Inc. The Alliance is responsible for directing the management of the Rouge Park. At its May 15, 1996 meeting the Rouge Park Alliance passed the following resolution:

Res. #63/96

THAT the Rouge Park Alliance supports the Province in securing the environmental approvals to allow accelerated design and construction of Highway 407 east of Markham Road based on the technically preferred route as established through earlier route planning work and public consultation.

AND FURTHER THAT the Province report back to the Alliance with a detailed process plan for the next Rouge Park Alliance meeting, being Meeting #5/96.

Subsequent to this meeting the Draft Stakeholder Consultation Process was provided to the Alliance, followed by a meeting with Alliance staff to receive comments and refine the consultation process. The revised process was presented to the Alliance on November 13, 1996. At that meeting, the Project Team became aware of some remaining concerns with the Stakeholder Consultation Process on the part of the MTRC and MNR. At the meeting, the Rouge Park Alliance unanimously passed the following resolution:

Res. #124, #125, #126/96

THAT the Final Draft Stakeholder Consultation Process - Highway 407 Partial Extension report and verbal presentation be received;

AND FURTHER THAT the Rouge Park Alliance accept the Stakeholder Consultation Process, subject to resolution of concerns of the review agencies.

THAT details be provided by the Natural and Cultural Heritage Subcommittee as to how the Rouge Park Alliance will be involved in the Process;

AND FURTHER THAT the Rouge Park Alliance have a close working relationship with all Stakeholders.

Following this meeting, the Project Team undertook additional consultation with MNR and MTRC to resolve the remaining outstanding issues. The planning level issues have been resolved. Some of the design-related issues cannot be resolved until the design phase and will receive further discussion and resolution through the Stakeholder Consultation Process.

On December 1, 1996 the Rouge Park Alliance approved by way of Resolution #146 and #147/96, the following two resolutions contained within the Rouge Park Natural and Cultural Heritage Report.

Res. #149/96

THAT the Rouge Park Alliance be represented at 407 Stakeholder Meetings by Ron Christie, Chair, Rouge Park Alliance or Gord Weeden, General Manager of the Rouge Park;

THAT the Chair or the General Manager may draw on the expertise of any of the Rouge Park Subcommittee members that he wishes, depending on agenda items to be discussed;

THAT it be made clear to the 407 representatives that, at the discretion of the Rouge Park Alliance representative, any number of subcommittee members may accompany the Alliance representative to the stakeholder meetings;

AND FURTHER THAT the Rouge Park Alliance submit a Position Statement to the 407 Stakeholders as recommended by the Rouge Park Natural and Cultural Heritage Subcommittee (under separate cover).

Elected Representatives

A briefing session was held on March 11, 1996 with provincial elected representatives within the study area to review the study progress to-date. In addition they were kept informed throughout the study through meetings and information bulletins. Specifically, update bulletins were provided to all local MPPs in April, July and October, 1996. Additional meetings were held to discuss specific issues of concern as required. The following elected representatives were contacted:

MPP Durham East
MPP Durham Centre
MPP Durham West

MPP Markham
MPP Oshawa

Summary

The presubmission consultation process resulted in general acceptance of the technically preferred route established through the Route Planning Study, and support for the partial extension of the Highway 407/Transitway to Highway 7 east of Brock Road. There was however, strong representation made by the agencies, special interest groups and the public to protect the valued ecological systems within the study area. Specifically, the Rouge Park Alliance and the MNR requested that a process be developed for involving stakeholders during the design and construction phase of the project. As a result, a Stakeholder Consultation Process was developed jointly with stakeholders, and forms the basis of the commitments set out in Chapter 6.

1.6.3 Presubmission Review

The presubmission consultation process involved the preparation of a Draft Environmental Assessment that was provided to the Federal and Provincial review agencies, the Metro Toronto Region Conservation and the Rouge Park Alliance for comments. Following receipt of the comments, meetings and/or telephone conversations were held for clarification purposes. The comments received have been taken into account in the preparation of this final EA. The specific comments and a table showing the way in which the comments have been addressed are provided in Appendix 24.

CHAPTER 2

PROBLEM AND OPPORTUNITIES

2.0 PROBLEM AND OPPORTUNITIES

This chapter provides a synopsis of the transportation analysis undertaken for the proposed Highway 407 /Transitway from Markham Road easterly to Highway 7 east of Brock Road. A detailed description of the undertaking is provided in **Chapter 1**. The material presented in this chapter defines the problems to be addressed and, in essence, the need and justification for the proposed facility from a traffic and transportation perspective.

The work undertaken as part of this study was intended to assess and identify problems within the context of the Highway 407 Overview Study undertaken by the Provincial Government in 1989. The 1989 Overview Study represented a comprehensive review of transportation deficiencies and opportunities in the Regional Municipality of Durham and adjacent communities and identified transportation corridors that should be protected from potential future development.

The need for Highway 407 within the Regional Municipality of Durham and a higher order transit facility or transitway along or adjacent to the Highway 407 corridor, were identified in the Overview document. The transportation planning work undertaken as part of this study recognizes the transportation framework and direction established in the Overview document while addressing changes in demographics, transportation infrastructure, commuting patterns, growth, etc. which have occurred since the document was produced.

2.1 INTRODUCTION

In the early 1990's, the Provincial Government implemented a program to accelerate the construction of Highway 407 between Highway 403 in Mississauga and Markham Road in the Town of Markham. Highway 407 is planned to open to Markham Road by 1998. There is currently no schedule for the extension of Highway 407 to the east of Markham Road. Since 1993, the Town of Markham and the Regional Municipality of York have expressed concerns about the impact that Highway 407 traffic will have on Markham Road between Highway 407 and Highway 7 and in Old Markham Village.

In addition to the anticipated problems on Markham Road resulting from the termination of Highway 407 at Markham Road, there are other prevailing transportation issues in the area of the Metro-York/Durham boundary that will be exacerbated by the termination of Highway 407 at Markham Road. Deficiencies in person-transportation capacity across the boundary are currently manifested as congestion on the local east-west roadways creating traffic and environmental problems in hamlets and other communities in both Markham and North Pickering.

Long-range planning conducted at the Provincial, Regional and local jurisdictional levels, including the Highway 407 Overview Study, has identified the need for major transportation system (transit and road) improvements across the Metro-York/Durham boundary and within Durham Region, particularly in the Highway 7 corridor. It has long been recognized by the staff of the area municipalities, Durham and York Regions and by the Province, that a combination of road, transit and non-structural (transportation demand management, e.g. HOV lanes, growth

management, etc.) system improvements will be required to resolve existing transportation problems and to address future transportation demands across the Metro-York/Durham boundary and through Durham Region.

2.1.1 Project Objectives

The transportation related objectives of the undertaking can be summarized as follows:

- To address prevailing and future transportation/traffic problems across the Metro-York/Durham boundary including the mitigation of existing traffic problems in communities within Markham and Pickering;
- To address anticipated traffic-related concerns in the Markham area that may result from the termination of Highway 407 at Markham Road;
- To ensure that the proposed undertaking is compatible with the long-term transportation system needs across the Metro-York/Durham boundary and within Durham Region, as identified through earlier planning studies; and
- To ensure that the need to protect for long-term transportation facility needs (road and transit) in the proposed Highway 407/Transitway corridor is acknowledged through the analysis.

It is fundamental to recognize that, although the premise behind the proposed undertaking is to minimize the impact of terminating Highway 407 at Markham Road on local area communities and to address existing deficiencies across the Metro-York/Durham boundary, there is also a need to assess the justification for a proposed facility in the wider Regional and Provincial context. In assessing the need for the facility; engineering, social and natural environmental, and economic factors must be recognized and addressed.

The analysis summarized in this chapter focuses on person mobility and goods movement across the Metro-York/Durham boundary in an effort to address existing capacity deficiencies and to identify transportation system requirements.

2.1.2 Related Studies

Over the last decade there have been a number of transportation and planning studies undertaken that have dealt with the need for Highway 407 east of Markham Road or have included Highway 407 as an integral element in the transportation network in the Region of Durham. A brief synopsis of the most significant of these studies is provided below. **These studies are in addition to the Highway 407 Overview Study, Route Planning Study, and Feasibility Study which are discussed in Chapter 1.**

Highway 407 Transitway System Plan and Station Site Plan Study (Highway 48 to Courtice Road) [Ongoing] - Provision is being made in the design of the Highway 407 corridor to include a transit facility as an exclusive grade-separated busway with protection for a possible future conversion to light rail transit. There is a need to provide greater definition to the transit component to facilitate input into and integration with municipal planning strategies and respond to development

proposals. The system plan and station site analysis will identify potential station locations/configurations from Markham Road to Courtice Road in the Town of Clarington.

Transitway Corridor Protection Study - Highway 407/Parkway Belt West Corridor from Highway 403 to Markham Road [Ongoing] - In recent years, the province has been identifying and disposing of surplus properties within the Highway 407/Parkway Belt West Plan corridor, located between Highway 403 in Mississauga and Markham Road. For this reason, the Ministry of Transportation must define and protect the required properties for a separate transit right-of-way in the corridor.

The 407 Transit Corridor Protection Study is to determine the property requirements for the transit facility including the line haul alignment, station locations, parking, access, connections and associated facilities for bus technology while maintaining flexibility for converting to light rail transit technology in the future. Approval to implement the transit system, required under the Environmental Assessment Act, will be sought at a later date by undertaking a more detailed study which will include public and agency consultation to meet the EA requirements.

York Region HOV/Rapid Transit Study - The purpose of this study was to establish the need, justification and implementation plan for the high occupancy vehicle and rapid transit networks that will be required in the York Region's urban area (Steeles Avenue north to Newmarket) to achieve the transit objectives in the Region's Official Plan. The study, which was completed in June of 1995, confirmed the future need for a transit facility in the Highway 407 corridor.

Highway 7/407 Transit Planning Strategy - Over the past year, staff representatives of the Ministry of Transportation, Regions of York, Durham, Peel, Municipalities of Vaughan, Richmond Hill and Markham and GO Transit have participated in developing a consensus on a long term strategy for developing transit in the Highway 7/407 corridor in York Region.

This exercise resulted in the preparation of a Strategy Study and a Statement of Intent endorsed by the participants. The Statement of Intent confirms a work plan to begin implementation and plan for continued cooperation/consultation.

There are two main elements of the strategy:

1. Provision for the longer term evolution of transit service in the Highway 407 corridor from buses in mixed traffic to HOV to a grade separated transitway. MTO is to carry out a property protection study for the transitway.
2. Designated HOV lanes on Highway 7 with early implementation on the section from Pine Valley Drive to Woodbine Avenue. Transit service would further evolve over time to median protected transit where warranted.

GTA Transportation Plan [Ongoing] - The Ministry of Transportation in partnership with the Greater Toronto Area Regions, is currently developing a plan which addresses the future transportation needs of the GTA. The plan is to enhance the inter-regional mobility of people and goods, while supporting broad economic, social and environmental objectives of the GTA region.

The plan addresses three critical themes: preservation; optimization; and selective expansion. It will include recommendations for policy initiatives, capital expansion, implementation and funding strategies for all ground modes of transportation to the year 2021.

Region of Durham Transportation Study Review [Ongoing] - This study, which is currently being undertaken by the Region of Durham, includes a comprehensive review of transportation requirements for the Region. The demand forecasting work completed for this study included consideration of demand management strategies designed to reduce automobile travel in the Region and between the Region and other areas within the GTA. Even with the consideration of optimistic demand management targets, the study has reconfirmed the need and justification for Highway 407 along with other arterial and high order transit facilities. This study will be completed in 1997.

GTA HOV Network Strategy Study (1996) - The purpose of this study was to develop a coordinated High Occupancy Vehicle (HOV) strategy for the GTA which includes both the Provincial highway and municipal road networks. The study outlined a recommended HOV network, an overall implementation strategy and early HOV initiatives which could be undertaken. The institutional and support requirements such as marketing and communications, transportation demand management, enforcement and transit operations were also addressed.

Markham By-pass Class Environmental Assessment Study (1996) - The Town of Markham carried out a Class EA Study for the Markham Bypass during 1995 and 1996. The study recommended a route for the Markham By-pass that extended northerly from proposed Highway 407 at a point west of 10th Line, to provide service to the Cornell development and then intersect with Highway 48 in the vicinity of Major Mackenzie Drive. The Environmental Study Report for the Markham By-pass was filed in the summer of 1996 and, as of the time of preparation of this Highway 407/Transitway EA study, the Ministry of Environment and Energy was considering requests for "bump-up" to an individual Environmental Assessment.

Markham/Scarborough Link Environmental Assessment Proposal (1995) - An Environmental Assessment Proposal (EAP) was carried out under the joint proponentcy of Markham and Scarborough during 1995 to (i) review the need for a roadway link between proposed Highway 407 and Highway 401 in the Morningside corridor, and (ii) provide guidance for any subsequent investigations. The Town of Markham endorsed the EAP. However, in early 1996 the City of Scarborough approved a report recommending the City cease its participation in the study. The project is no longer being actively studied.

Northeast Metro/Southeast York/West Durham Strategic Transportation Review (1995) -The Ministry of Transportation, with assistance and cooperation from regional and local municipalities, undertook a study to review the long term transportation needs of, and develop a transportation strategy for, the area comprised of northeast Metropolitan Toronto, southeast York Region and west Durham Region. The technical aspects of the Strategic Transportation Review were completed in 1993. The final report was released in August 1994 following further study of the need for a transportation facility in the Morningside corridor and the finalization of the Rouge



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to Highway 7 East of
Brock Road**



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Park Management Plan. The study also included the development of updated population and employment forecasts released by the Office for the Greater Toronto Area.

The strategy recommended by the study includes three components:

1. The need for greater self containment in York and Durham (i.e. more people living and working within the same community) to reduce inter-regional commuting;
2. The need for more transit conducive forms of development to increase public transit's share of trips crossing regional boundaries; and
3. The requirement for additional highways, roads, and inter-regional transit facilities, including the Highway 407/Transitway

Pickering Lands Access Study (Airport Access) (1995) - The Pickering Lands Access Study was completed in October 1995. It is an internal Transport Canada study with funding from MTO. The Study was a technical investigation which was intended to represent an initial review of the feasibility of providing access to the federally owned property known as the Pickering Lands. It is a preliminary review of the possibility/feasibility of providing access and recommends what further studies must be undertaken to protect the potential access corridors. All of the transportation access scenarios recognized the need for the Highway 407/Transitway east of Markham Road.

Markham Transportation Study (1994) - This study addressed overall transportation issues for the Town to the year 2021. A major conclusion of the study, relevant to this project, is the need for Highway 407 to extend at least to the Markham By-pass in its initial stage (by 2001). The need for a Markham By-pass is included in this study in order to support development of north and east Markham, including Cornell. The study included a major focus on transit/Transportation Demand Management (TDM) improvements in order to reduce the emphasis on auto travel by means of a grid-based Regional Transit system with a focus on major activity centres, expanded GO Service for both Richmond Hill and Stouffville GO lines, and development of an extensive HOV network.

Steeles Avenue East Class Environmental Assessment (1991) -This Class Environmental Assessment, undertaken by the Municipality of Metropolitan Toronto, included an extensive need and justification component which not only confirmed the need for the widening of Steeles Avenue between McCowan Road and Pickering Townline Road but also reaffirmed the need for Highway 407 east of Markham Road along with other arterial roadway and transit improvements. The Environmental Assessment was approved by the Ministry of Environment and Energy (MOEE) in 1994. Portions of the Steeles Avenue widening, proposed in the EA, are currently under construction.

2.1.2.1 Summary of Previous Studies/Findings

As discussed above, there have been numerous planning and transportation studies undertaken in west Durham, the eastern portions of Metropolitan Toronto and the Region of York. Although many of these studies have employed or tested different assumptions relative to demographics,

transportation demand management strategies, and network improvements, conclusions regarding the need for Highway 407 East have been consistent. All of the studies undertaken in this area recognize the transportation related constraints in and around the Study Area and the need for addition east-west transportation capacity across the Metro-York/Durham Boundary. A number of these studies also recognize that a combination of roadway, transit and TDM improvements is required to satisfy transportation demands.

Transportation requirements in the area, as documented in many of the above studies, were identified as a result of assessments which recognized socio-economic, natural environmental, social and technical issues.

2.1.3 Approach and Process

The following section describes the various aspects of the approach used to assess the transportation problems and deficiencies as part of the Feasibility Study.

Transportation Study Area

For the purposes of the transportation system analysis component of the Feasibility Study, a Transportation Study Area was defined which covers an area bounded by McCowan Road, Elgin Mills Road, Lake Ontario, and east of Brock Road, as shown in **Exhibit 2.1.1**. A secondary area which includes the GTA and municipalities adjacent to the GTA, was also established to ensure that an "area wide" perspective of the transportation issues and opportunities was considered in the context of this study.

Screenlines and Corridors

In order to assess the overall transportation "picture" and to permit assessment of relevant and practical transportation servicing opportunities, a series of screenlines were used. A screenline is an imaginary or real boundary across which all travel demand and capacity is totaled.

Three major screenlines were used to analyze east-west travel through the Transportation Study Area:

- The Metro-York/Durham boundary (west of Durham-York Line) from Elgin Mills to Highway 401;
- West of Brock Road from Regional Road 5 to Bayly Street, and;
- East of Brock Road from Regional Road 5 to Bayly Street.

Within the screenlines, there are two major corridors reviewed in the context of the work which is summarized in this chapter: Highway 401 and Highway 7. The assessment of existing transportation issues was undertaken primarily for travel across the Metro-York/Durham boundary.

While the overall transportation system was assessed on the basis of screenline problems, localized transportation issues/problems were also identified on a location specific basis, particularly in the

area of the presently planned terminus of Highway 407 at Markham Road and on links through communities along the Highway 7 corridor.

Time Period Used for Analysis

For the purposes of this analysis and the analysis of future conditions, the morning peak hour (a.m. peak hour) was chosen. This is the typical time period used for transportation analysis purposes in the GTA as it can be more accurately modeled than the evening (p.m.) peak hour. The a.m. peak hour is the time period used in the travel demand forecasting model used for this study. The a.m. peak hour does not, in many circumstances, reflect peak travel conditions. The p.m. peak period generally represents the worst case conditions but travel in this period is more difficult to forecast. During the a.m. period, there is a high percentage of commuter work trips which can be modelled with greater reliability than trips in the p.m., which tend to be less predictable. Although the a.m. peak hour was used in the analysis summarized in this chapter, a review of the mobility requirements/opportunities for recreational travel was also considered.

Field Surveys and Studies

In addition to the utilization of cordon count and traffic-related data provided by numerous municipalities in the area, independent and extensive field surveys were conducted as part of this project. This was done to audit data, confirm problem areas identified through the consultation process, and to permit examination of the traffic conditions in non-peak periods, summer, and inclement weather conditions.

Existing and Future Travel Demands

A detailed review of the existing transportation system was conducted prior to an assessment of future transportation system demands. This review is provided in Section 2.2.

Forecasts of future travel demands were prepared using a travel demand forecasting model developed for the entire GTA. As noted, this model is based on morning (a.m.) peak hour auto travel demands. The model used for this exercise is the same model that was used for the Highway 407 Central forecasting. The model has been developed to forecast travel demands on Highway 407 east of Markham Road, assuming that it is a toll-facility. The same toll assumptions were applied to this project that were used to model travel demand on Highway 407 Central. It is important to note that, should the roadway not be considered as a toll facility, the demand for its use would be greater - possibly by 15-20 percent. The overall results of the traffic analysis summarized in this document would not significantly change if tolls were eliminated. The tolls do not impact the overall deficiencies that will be realized on the transportation network with growth in the Study Area.

Although the model is an auto-based model, transit usage assumptions are included and, therefore, transit demands can be derived from the model results. Details on the forecasting assumptions and detailed model inputs are included in **Section 2.3** and **Appendix 23**.

2.2 EXISTING TRANSPORTATION SYSTEM

This section provides a detailed description and assessment of the existing transportation system within the Transportation Study Area. The focus of this assessment is on the Metro-York/Durham boundary since it is of prime concern in terms of existing problems and needs. This boundary has been studied extensively over the last 20 years, and as a result, there is a significant database of information regarding travel demands, trends, and potential opportunities.

While the focus is on cross-boundary travel conditions, discussions are also provided with regard to travel conditions at Brock Road and in sensitive local areas such as established rural and urban communities in the Highway 7 corridor.

2.2.1 Existing Transportation Facilities

The road authorities within the Transportation Study Area include the Ministry of Transportation, Region of Durham, Region of York, Town of Pickering, Town of Ajax and Town of Markham. These Provincial highways, Regional roads and Town arterial roads together form a hierarchical grid system of roads in the Transportation Study Area.

MTO data sources were reviewed and the following agencies contacted to establish/reconfirm existing and proposed transportation networks, within the Transportation Study Area:

- Region of Durham (Towns of Pickering and Ajax);
- Region of York (Town of Markham);
- C.P. Rail;
- GO Transit; and
- Local Transit.

The following Federal, Provincial and Municipal Transit agencies were contacted to ascertain present and future levels of transit services which will be provided within the Transportation Study Area:

- | | |
|-------------------|---------------------|
| • VIA Rail | • Pickering Transit |
| • GO Transit | • Ajax Transit |
| • Intercity Bus | • Whitby Transit |
| • Markham Transit | • Oshawa Transit |

2.2.1.1 Provincial Highways

The Provincial highways through the Transportation Study Area are described as follows:

Highway 401 - This is a fully controlled access highway which runs in an east-west direction through the Transportation Study Area. It is a 6 lane facility between Port Union Road and Highways 35/115. Highway 401 is the most important road link in the Region of Durham for the movement of people and goods. During peak hours, a substantial percentage of traffic on

Highway 401 in the Region of Durham is commuter (home-to-work) trips to Metropolitan Toronto. From a provincial perspective, Highway 401 is the primary east-west facility through southern Ontario linking major centres between Windsor and the Quebec border. A widening of Highway 401 to a core-collector system with a total of 12 lanes between Neilson Road and Brock Road, Pickering, is now under way and expected to be completed by 1997/98. As of the time of this writing, the widening of Highway 401 has been completed between Neilson Road in Metropolitan Toronto and Whites Road in Pickering.

Highway 7 - Is a two lane rural highway running in an east-west direction through the Regions of Durham and York. Within the Region of Durham, Highway 7 links the hamlets of Green River, Brougham, and Brooklin; and bypasses Greenwood. Highway 7 has a 4-lane urban cross-section within the Town of Markham, west of the Markham By-pass and a 2-lane rural cross-section throughout the rest of the Transportation Study Area. The right-of-way generally varies from a basic 36.5 m to 45.7 m. Widening of Highway 7 east of 9th Line in Markham is not possible without significant "physical" environmental impacts to the communities of Locust Hill, Green River and Brougham.

Markham Road/Highway 48 - This facility runs in a north-south direction through the Region of York. It runs northerly from Princess Street to Georgina Township where it swings east and connects with Highway 12. At its southern end, it serves the urban area of Markham and Metropolitan Toronto. In the Town of Markham there is a 2-lane section in the vicinity of the Rouge River crossing just south of Highway 7. Widening of this section of Markham Road is not planned. South of Princess Street, Markham Road is under municipal jurisdiction and ultimately becomes a 6-lane major arterial roadway as it enters Metropolitan Toronto.

2.2.1.2 Municipal Road Network

Three roads within the Region of York portion of the Transportation Study Area are classified as Regional Roads. They are Ninth Line, 16th Avenue and the Durham-York Line (York Road 30). 14th Avenue is a two-lane Markham road which is discontinuous at the York/Durham boundary. Ultimately, it is planned to connect to 5th Concession in Durham Region¹.

In the Region of Durham, the major east-west arterial roads in the Transportation Study Area are Kingston Road, Rossland Road, Taunton Road (Regional Road 4), 5th Concession Road/Conlin Road and 7th Concession Road/ Columbus Road (east of Brock Road). These are basic two lane rural roads with the exception of Kingston Road (formerly Highway 2) and a section of Taunton Road at the west end of the Region of Durham which has 4 lanes between Brock Road and Durham-York Line (York Road 30). Except for the Taunton Road/Steeles Avenue connection, there are discontinuities and missing links along these arterial roads preventing continuous east-west travel in the Region of Durham. Moreover, these arterial roads are not well connected with the road network of Metropolitan Toronto and the Region of York.

¹ *Durham Region Official Plan, 1993*

The major north-south arterial roads are evenly spaced at approximately 2 kilometre intervals. To the north of the built-up areas of Pickering and Ajax, these north-south arterial roads are two lane rural roads. Several of these north-south roads lack continuity in the rural areas such as Whites Road, Dixie Road, Church Street and Pickering Beach Road. Brock Road is the main north-south arterial road in Pickering, Westney Road (Regional Road 31) is the main north-south arterial road in Ajax.

Within Metropolitan Toronto, there are several major east-west roads, west of the boundary, including Finch Avenue, Sheppard Avenue, Twyn Rivers Drive and Steeles Avenue. Finch Avenue is discontinuous at the boundary with Rossland Road. Recently, a proposed connection between Finch Avenue and Rossland Road has been removed from the Metropolitan Toronto Official Plan and approved for removal from the Durham Official Plan by Durham Council in response to a *Provincial Rouge Park Management Plan Policy stating that no "new" road crossings through the Rouge Valley Park south of Steeles Avenue will be constructed*. For the same reason, both the Region of Durham and Metropolitan Toronto Councils have approved removal of the long planned Lawrence Avenue/Bayly Street connection from their respective Official Plans.

A recent study conducted by the City of Scarborough resulted in Scarborough Council re-affirming that Twyn Rivers Drive will remain at its existing capacity (one lane across a key bridge) and retain its function as a "local" road.

The Municipality of Metropolitan Toronto has completed an Environmental Assessment to upgrade Sheppard Avenue to four lanes between Kingston Road and Meadowvale Road. However, this improvement will have limited effect on cross-boundary capacity, particularly considering the status of Twyn Rivers Drive.

In summary, there are numerous discontinuities in the east-west road network through the Transportation Study Area. More significantly, there are limited opportunities for improving or eliminating these discontinuities to provide additional east-west capacity. The only remaining opportunities to provide significant additional east-west arterial capacity appear to be the 14th Avenue/5th Concession and Steeles Avenue/Taunton Road connections.

2.2.1.3 Transit Service

The following represents a discussion of existing available transit services and the potential for future expansion of these and other services.

VIA Rail

Passenger rail service exists on the Lakeshore East line which is shared by VIA Rail, GO Transit and CN. VIA Rail no longer provides intercity passenger rail services on the CP Rail Havelock Subdivision. However, VIA services are primarily inter-city and do not serve a commuter function between Durham Region and Metropolitan Toronto. There are no current plans to upgrade this service whereby it could play a greater role as a commuter service.

GO Transit Rail Services

GO Transit currently provides full service on the Lakeshore East line as far as Pickering, which comprises 10 minute service during the peak periods and 1 hour service during the off-peak periods. Peak period service is extended as far as Oshawa (every 20 minutes) and Whitby (every 15 minutes approximately). The train capacities during peak periods are 2000 passengers per train. During the day (off-peak), GO buses operate between Pickering Station and other stations to the east (Ajax, Whitby, Oshawa) as well as to Bowmanville in lieu of train services. In 1995, Lakeshore East rail services were reduced from all day service to Whitby to all day service to Pickering. GO buses service the stations east of Pickering during off-peak times.

Previous GO service expansion plans have included:

- Extending full service to Oshawa;
- Adding a track in Metro to provide more frequent peak period service and increased capacity; and
- Provide additional Highway 401 bus services to meet the demand.

Provision of these service/infrastructure improvements depends on demand and the availability of Provincial funding. At the time of this writing, GO Transit did not have schedules for service expansion along the Lakeshore East Line in the Region of Durham. GO Transit has also confirmed that there are no Provincial commitments or plans to provide commuter rail services on the CP Rail Havelock line following rail service abandonment by VIA.

Intercity Bus Services

GO Transit bus services serve intercity demands between communities in Durham Region and Metropolitan Toronto along the Highway 2 and Highway 401 corridors. The Highway 2 service is primarily a commuter service connecting Durham Region to the Scarborough City Centre, York Mills Subway and Yorkdale Shopping Centre. Buses operate between Oshawa and Metro Toronto every 10 minutes during peak periods and 30 minutes during off-peak periods. GO buses are also used to connect communities in the east end of Durham to the Lakeshore GO Line. GO buses connect from Bowmanville to the Oshawa GO station every 20 minutes during the peak periods and to the Pickering Station every hour during off-peak periods. No additional intercity services are planned at this time.

Municipal Bus Services

All municipalities in the Transportation Study Area provide traditional transit services within their boundaries including Pickering, Ajax, and Markham. Within both Pickering and Ajax, the majority of transit services are oriented to the GO stations during peak periods.

The Region of York is currently investigating the viability of Regional Transit Services which would replace existing local municipal services. It has yet to be determined if and when these services will exist and the routes that will be developed to serve the Transportation Study Area.

The Region of Durham, in conjunction with the area municipalities, is investigating ways of improving intermunicipal bus service provided by Pickering, Ajax, Whitby and Oshawa. A study is currently underway to identify transit needs in the Highway 407 Corridor, east of Markham Road, as discussed in **Section 2.1.2**.

2.2.2 Existing Travel Demands

An extensive review of travel demands was undertaken to identify existing problems and trends that have been established in the east-west travel corridors and across critical screenlines in the Transportation Study Area. A summary of the review and identified problems is discussed below.

Existing travel demands are discussed below in terms of both person travel and vehicle travel demands. It is important to understand that in the future, changes to travel patterns and behaviours could change the nature of travel demands and their distribution to various modes.

2.2.2.1 Existing Demands Across the Metro-York/Durham Boundary

Table 2.2.2 shows existing travel demands across the Metro/Durham boundary in terms of both person travel and vehicle travel for 1991 and 1995² (1995 is the latest data available for *all* modes of transportation at this location). Most of the GTA Regions participate in a cordon count program through which person and vehicle travel data is collected at consistent cordons (boundaries) throughout the GTA. This program is carried out every two years and represents the most comprehensive historical database of travel data for individual transportation facilities and cordons. The cordon count data was the primary source of information used in the analysis of the Metro-York/Durham boundary.

Table 2.2.2
East Metro/West Durham Boundary Travel Demands
1991 and 1995 A.M. Peak Period (6:30 - 9:30)

Year	Persons		Vehicles	
	1991	1995	1991	1995
Auto Trips	30,500	34,900	25,500	31,100
Trucks	-	-	2,900 (10.3% of the Vehicles)*	3,700 (10.7% of the Vehicles)*
Transit (Including GO)	7,900 (20.7% of Persons)*	8,400 (19.5% of Persons)*	-	-

* Percentages based upon actual unrounded numbers

Source: Cordon Counts, Metropolitan Toronto

Person Demands

Historically transportation demand has been expressed in terms of traffic (automobile, truck, and bus) volume (or demand) versus roadway capacity. However, for this study, it was considered essential and more comprehensive, that *total person travel* be assessed in terms of demands and capacities, where the demands and capacities are estimated for the two primary modes of travel, auto and transit.

For the purposes of identifying trends, the Metro/Durham boundary (Highway 401 to Steeles Avenue) has been used. This boundary has been the subject of many surveys of traffic and person travel since the early 1970's. The data collected at this location is a very good indicator of travel conditions and behaviour for the Metro-York/Durham boundary as a whole.

Based on 1995 cordon count data, more than 43,000 persons cross the Metro/Durham boundary (Highway 401 to Steeles Avenue) each morning peak period (6:30 to 9:30 a.m.). Of those, about 8,400 (19.5%) travelled by transit, with about 7,200 travelling by GO Train and the remainder travelling by GO Bus and school bus.

By comparison, in 1975, there were only 12,500 persons travelling across the Metro/Durham boundary with less than 17% travelling by transit. The growth in person travel represents an average of more than 6.4% (compounded) per year or a tripling of person travel demand in 20 years. The comparable growth in population in Durham from 1975 to 1995 is a factor of 3.3%/year. These results show that there are several factors that have affected cross-boundary travel demands in addition to population growth, including employment growth in Metro Toronto, increases in trip-making during peak periods, and increased participation in the work-force.

Transit Demands

Transit use across the boundary has been relatively constant since 1983 in terms of percentage of total travel across the boundary, although absolute numbers have increased. The modal split to transit peaked in 1989 at 20.9% and has decreased slightly since that time. However, as discussed above there are over 8,400 transit riders crossing the Metro/Durham boundary during the peak period (6:30 - 9:30 a.m.), representing a substantial proportion of cross-boundary travel. Transit plays a major role in serving cross-boundary demands that have been consistently growing.

The majority of Pickering and Ajax residents who are destined to Downtown Toronto for work (approximately 67%³) currently travel by GO train. This indicates the success of GO Rail transit in capturing a high market share for those travelling to Downtown Toronto.

³ 1991 Transportation for Tomorrow Survey

Roadway Demands

Roads in the Highway 401 corridor (Highway 401 to Steeles Avenue) are at capacity today with significant delays being experienced by drivers in extended morning and afternoon peak periods. These peak periods last approximately three hours each. The construction of a core-collector system on Highway 401, as far as Brock Road, is expected to reduce the length of the period of congestion during the peak period. However, it is important to note that the improvements to Highway 401 will not remove all of the existing transportation deficiencies across the Metro-York/Durham boundary. The auto occupancy in this corridor is 1.13⁴ occupants per vehicle during the peak hour.

The Highway 7 corridor (from Major Mackenzie Drive to 14th Avenue) is also at capacity today. There is no scheduled transit service in this corridor and almost all travel across the boundary in this area is by private vehicle. The average auto occupancy in the corridor is 1.13⁵ occupants per vehicle in the a.m. peak hour.

Congestion in both the Highway 401 and Highway 7 corridors results in motorists searching for other local routes across the Metro-York/Durham boundary. The re-routing of vehicles to local roadways results in traffic impacts on small rural communities along these routes (e.g. Whitevale and Box Grove) as well as on the Rouge Valley Park.

Person Carrying Capacity

In order to maximize the use of existing transportation facilities, there are a number of means by which it is possible to increase the person carrying capacity as opposed to the vehicle carrying capacity. Some examples of increasing person carrying capacity include increasing the number of transit vehicles and increasing private automobile occupancy. A detailed discussion of both transit opportunities and the potential and means by which auto occupancy could be increased is presented in **Section 2.3.3**.

Auto occupancy across the Metro/Durham boundary (Steeles Avenue to Highway 401) has been decreasing over the last decade. Based on historical cordon count data, the auto occupancy peaked in 1983 at 1.27 persons per vehicle and has been decreasing since that time to 1.12 persons per vehicle in 1995⁶ during the a.m. peak period.

In the short term, there are limited opportunities to increase capacity on the Lakeshore GO Line during peak periods since it is operating at full service today as far as Pickering, with full peak period service to Oshawa.

⁴ 1995 Cordon Counts, Metropolitan Toronto

⁵ 1993 Cordon Counts, York Region

⁶ 1995 cordon Counts, Metropolitan Toronto and York Region

Other Travel Demands Across the Metro-York/Durham Boundary

There are a number of other travel demands across the Metro-York/Durham boundary other than commuters, which have an economic significance to the GTA, the surrounding communities, and the Province in general. These demands relate to:

- Commercial vehicles;
- Recreational travellers; and
- Long-distance travellers from areas east and west of the GTA (primarily on Highway 401).

Commercial vehicle travel has grown at a significant rate across the boundary in absolute numbers. Based on historical cordon counts, commercial vehicle travel has increased from approximately 1,700 to 3,700 vehicles (6:30 - 9:30 a.m.) over the period from 1975 to 1995. However, travel during peak periods has remained relatively constant as a percentage of total travel (between 9-11%), primarily due to levels of congestion, which commercial and recreational vehicle operators attempt to avoid. However, with the continued lengthening of the peak periods, it is becoming more and more difficult for commercial vehicles to avoid congestion.

East of Durham Region, commercial vehicle travel represents 25%⁷ of the vehicle demand on Highway 401. The importance of Highway 401 as a major economic linkage in Ontario and to other major markets cannot be understated.

Recreational travel along the Highway 401 corridor represents a major demand during the summer months (May to September). In the east end of Durham Region, summer weekday traffic on Fridays can be as much as 42% higher than summer mid-week volumes. Given the prevailing congestion levels on an average weekday, this increase in demand results in major delays for all vehicles in the Highway 401 corridor and also negative impacts in the form of traffic infiltration within local communities, in particular South Pickering. Highway 7 is also a significant recreational travel corridor for travellers heading to the Kawartha and Trent Waterway recreational areas.

Travel studies along Highway 401, east of Durham Region, show that traffic is growing at a sustained rate of 3-4.8% per year⁸. This is expected to continue for the foreseeable future. This growth is a result of continued increases in inter-provincial movement of goods, recreational traffic and commuter traffic destined to the GTA, with some growth due to local residential development in east Durham and Northumberland County. This continued growth at the east end of Durham Region, contributes, in part, to the continued growth in cross-boundary demands at the Metro-York/Durham boundary.

⁷ *Traffic Study for the Preliminary Design of Highway 401, Highway 35/155 to Highway 28, April 1996, Ministry of Transportation, Ontario*

⁸ *Ibid*

2.2.2.2 Localized Problem Areas

Markham Road/Highway 7 Area

Of particular concern are traffic operations in the area of the Markham Road/Highway 7 intersection. Capacity constraints in this area, including at the intersection of Markham Road and Highway 7 are expected to be exacerbated by the opening of Highway 407 to Markham Road in 1998.

This section provides an overview of the existing problems in the area. Problems expected with the opening of Highway 407 to Markham Road in 1998 are discussed in **Section 2.3.4**.

The following summarizes the existing traffic conditions on roads in the Markham Road/Highway 7 area:

- **Markham Road** both north and south of Highway 7 is currently operating at or close to capacity in the a.m. peak hour in the southbound direction. The intersection at Markham Road and Highway 7 is currently operating at level of service "F" which reflects "fully congested" conditions;
- **Highway 7** west of 9th Line is currently operating under congested conditions during the morning peak hour. This congestion continues past Markham Road;
- **14th Avenue** east of Markham Road is operating at or close to capacity, particularly in the area of the 9th Line intersection in Box Grove; and
- **Steeles Avenue** operates at capacity along its length between Markham Road and Durham-York Line. Steeles Avenue is currently under construction from McCowan Road to the Durham-York Line and is being widened from two to four lanes. It is **not** anticipated that the widening will be complete by 1998, since construction has been deferred between the 11th Line and Tapscott Road. As a result, Steeles Avenue will continue to represent a "bottleneck" to travel across the boundary.

Local Communities in the Highway 7/407 Corridor

Locust Hill is located along Highway 7, east of 10th Line in Markham. This community is affected by the heavy traffic volumes along Highway 7 during both morning and afternoon peak periods.

Box Grove is situated along 14th Avenue, at the 9th Line in the Town of Markham. As noted above, 14th Avenue is at or close to capacity, with heavy traffic affecting the community during both peak periods.

Green River, in the Town of Pickering, is located along Highway 7 just east of the Durham-York Line. The community of **Brougham** is located along Highway 7 at Brock Road in Pickering. Highway 7 at both locations is at or close to capacity during both morning and evening peak periods.

Whitevale is located along Whitevale Road (Concession Road 5) in the Town of Pickering. Whitevale Road is heavily travelled during morning and evening peak periods by commuters avoiding congestion on Highway 7 and Steeles Avenue.

Greenwood is located south of the existing Highway 7 bypass of Greenwood, and west of Westney Road in the Town of Pickering. This community is affected by commuters short-cutting through the community on 6th Concession going to and from Highway 7 during both morning and evening peak periods. The Town of Pickering is investigating traffic calming methods and local road improvements to address these concerns.

2.2.3 Summary of Deficiencies/Problems

In summary, the following problems exist:

- There are significant deficiencies today across the Metro-York/Durham boundary. These deficiencies have resulted in:
 - extended peak periods - three hours in both the morning and afternoon;
 - delays to commercial vehicles across the boundary which ultimately result in increased costs to consumers for products;
 - increased societal cost in terms of lost productivity from congestion related delays; and
 - environmental impacts from increased vehicle emissions resulting from congestion and extended trip/travel times.
- The deficiencies across the boundary have resulted in drivers searching for other alternative routes and using local roads, particularly those through small communities (Whitevale, Box Grove, Greenwood) and through the Rouge Valley Park (Twyn Rivers Drive, Finch Avenue); and
- Congestion in the Markham Road/Highway 7 area is an ongoing problem which is expected to be exacerbated by the planned opening of Highway 407 to Markham Road in 1998.

Travel demands across the Metro-York/Durham boundary are continuing to increase in spite of the prevailing and anticipated congestion levels. Increasing demand is resulting in extended peak periods. The travel demand pressures at the boundary are a result of a combination of the demands from a number of different users including commuters, commercial vehicle operators, long-distance highway travellers, and recreational travellers. Current trends suggest that shifts in travel to transit and increased auto occupancy are not occurring and that both auto occupancy and transit use are in fact decreasing, again despite significant congestion on the roads.

A public opinion survey conducted by the Angus Reid Group Inc.⁹ for the Region of Durham as part of the Region of Durham Transportation Study revealed that "road congestion, particularly between

⁹ *Angus Reid Group Inc., Durham Transportation System Review - Public Opinion Research, 1994*

Durham and Metro Toronto, is the most serious transportation issue Durham residents feel they are facing at this time". Fully two-thirds of the respondents to the Region's survey indicated extreme or moderate dissatisfaction with road congestion between Durham and Metro. This portion increased to three-quarters for those living in urban areas in Southern Durham. Six in ten respondents to the survey, felt it is essential or, at least, very important to construct new roads to Metro.

From a transit perspective, there is more public support for improving GO transit service and developing public transit systems between municipalities (to Metro) than there is to improve public transit within individual municipalities. It is interesting to note that forty percent of those who did not use transit to get to work, have not been on a bus in at least one year.

The delays to vehicles crossing the Metro-York/Durham boundary affect not only commuters, but also commercial vehicles delivering goods to Metro and the rest of the GTA and to other parts of Ontario. Approximately 30 percent of the cost of moving goods in and through the GTA results directly from congestion related delays on the roadways in the GTA, and particularly on the Provincial Highway System¹⁰. This results in additional costs to goods in excess of 1 Billion dollars per year. It has been estimated that, over the next decade, approximately 15 Billion dollars will have to be added to the cost of goods to account for congestion related delays.

2.3 FUTURE TRANSPORTATION SYSTEM

The assessment of the future transportation system, discussed below, provides an in depth analysis of future transportation conditions from the perspectives of demand, capacity, and opportunities to meet the mobility requirements of the community.

2.3.1 Future Transportation Demands

2.3.1.1 Demand Forecasting Strategies and Assumptions

The Ministry provided access to the transportation demand forecasting model which was used in the assessment of Highway 407 Central. Details on the assumptions used in the model are discussed in **Appendix 23**. The key assumptions are discussed below.

MTO's trip tables (representing travel demands) for the morning peak hour, based on existing trip making characteristics and forecast population and employment levels for the years 1998, 2011 and 2021, were used in conjunction with the EMME/2 model software. The base year trip table is based on person travel demand and then adjusted to auto travel by removing other modes. The a.m. peak hour trip tables were assigned to the road networks using the same procedure and the same volume-delay functions as used for the Highway 407 Central modelling undertaken by MTO/OTCC.

The model generates future vehicle trips and vehicle-kilometres of travel on the roadway network (arterial and highway) for the Greater Toronto Area, including Highway 407. The model processes

¹⁰ Cole Sherman and Assoc, R.K. House, Metro Goods Movement Study, 1988

and assumptions that have been employed in generating traffic volumes for this exercise are consistent with those used for Highway 407 Central by MTO/OTCC.

For this analysis, the base a.m. peak hour model network was updated and refined in the areas of east Metropolitan Toronto and York, and in west Durham. The future networks (2011 and 2021) have included no provincial, regional, or municipal improvements other than the Highway 401 widening from Markham Road to Brock Road (6 lanes to 12 lanes), anticipated to be completed by 1998. The Markham/Scarborough link has not been included in existing or future networks.

All sections of Highway 407, including the easterly extension, were assumed to be tolled in the traffic analysis. Tolls are used in the model to impose a time penalty on Highway 407 relative to the cost of travel using a value of time to convert toll cost to equivalent time.

Current levels of transit mode split and cycling/walking use are incorporated into the model. Current levels of transit mode split are applied to increased future travel demands resulting in increased transit demands. The existing peak hour factor of 0.40 for morning peak hour to morning peak period (3 hour) based on 1991 TTS data was used for this study (as in previous GTA modelling). This peak hour factor is considered to be conservative since it reflects a significant level of peak travel spreading (i.e. assumes traffic is spread relatively evenly over the three hour peak period).

Land Use Forecasts

Population and employment assumptions in the model are based on the Hemson Scenario 1¹¹, developed by the Office of the Greater Toronto Area (OGTA) in 1993. These estimates have been accepted by the GTA Regions. The 1998 forecasts are interpolated from the Hemson forecasts. No assumption regarding development of the Pickering Airport has been included in the forecasts used in the traffic analysis discussed in this document. Population and employment assumptions for Metro, Durham and York are summarized in the table below for each horizon year.

Hemson - Scenario 1 Forecasts						
	Population			Employment		
Year	Durham	Metro	York	Durham	Metro	York
1991	409,000	2,276,000	505,000	156,000	1,368,000	248,000
1998	546,000	2,389,000	682,000	204,000	1,482,000	336,000
2011	800,000	2,541,000	970,000	305,000	1,680,000	496,000
2021	952,000	2,702,000	1,107,000	366,000	1,800,000	578,000

The Hemson Scenario 1 forecasts are based on employment to population ratios for each Region which are based on a continuation of the concentration of employment within Metro (to make most efficient use of the existing infrastructure, particularly the TTC and GO systems), with some increases in the outlying Regions to account for increased self-containment.

¹¹ *Population and Employment Outlook for the Greater Toronto Area, Hemson and Coopers & Lybrand, August 1993*

Of particular relevance to this study are the population and employment assumptions for two major development areas in the Highway 407 corridor; Seaton and Cornell. The Cornell community is expected to develop to a population of 30,000 by the 2021 planning horizon. With respect to the Seaton community, the North Pickering Development Corporation is currently undertaking a review of the development potential of the Seaton lands. The planning for Highway 407 Central assumed that a population of 90,000 will be achieved by the year 2021. For consistency, this assumption was carried forward to this study and used in the traffic analysis. It is recognized that the Durham Region Official Plan sets a target of only 45,000 people and 22,000 jobs for Seaton by the year 2021. It is fundamental to note that, the lower population target has little or no effect on the findings of the traffic analysis with respect to the need and justification for Highway 407 as articulated in this report. Even without the Seaton development, there are existing deficiencies in screenline capacity across the Metro-York/Durham Boundary.

The base auto occupancy assumption built in to the model is 1.2 occupants per vehicle, an average for the GTA based on the 1991 Transportation for Tomorrow Survey (TTS). This auto occupancy is a liberal estimate for the Transportation Study Area since the existing auto occupancy in the critical corridors is lower and, in the range of 1.13.

2.3.2 Future Forecasts

For the purposes of the travel demand forecasting, two basic scenarios for Highway 407 were assessed in terms of road network options:

1. Highway 407 to Highway 48 as currently planned by 1998; and
2. Highway 407 to Brock Road/Highway 7.

Although for the purposes of the work summarized in this chapter, only these two scenarios were assessed. Several other options were analyzed during the Feasibility Study (**Chapter 5**) including extending Highway 407 to the Markham By-pass, to 9th Line, and the Durham-York Line.

Auto assignments were prepared using the EMME/2 model for each of the three horizon years: 1998, 2011, and 2021. The summary below uses the results of these model assignments and expands them to include a discussion of person travel across each screenline.

2.3.3 Transportation System Opportunities

Future forecasting of travel recognizes that some opportunities are available to change the way people travel and change their commuting characteristics (i.e. reducing growth in auto demand). The purpose of making changes to travel patterns and behaviours is to:

1. Reduce investment in infrastructure;
2. Minimize natural/social environmental impacts; and
3. Reduce the overall cost of transportation.

The following provides a synopsis of opportunities which have been used in the forecasting process. An attempt has been made to identify realistic opportunities that would have a potential for success and have a real impact on reducing auto demands.

2.3.3.1 Travel Demand Management

Travel demand management (TDM) is a term used to describe a strategy or strategies which aim to:

- Reduce auto use in favour of transit, walking and cycling;
- Increase auto occupancy;
- Reduce the frequency of trip making; and
- Reduce the number of trips made during peak travel periods.

Although a broad range of TDM strategies currently exist today, there are several which may have some impact on travel demand within the subject study area and in particular across the Metro-York/Durham boundary. These measures include:

- Municipal and inter-city or inter-regional transit;
- Promotion of other modes of transportation including HOV, cycling, etc.; and
- Growth management.

Transit

In order to maintain a 20% transit mode share across the Metro-York/Durham boundary, major improvements to the transit infrastructure will be required. While some increases in transit travel to Downtown Toronto are expected in the future, high density employment nodes are developing, particularly along Highway 7, which could capture transit riders from Durham Region if a high quality transit service were provided. A high quality transit service in the Highway 7/407 corridor would require municipal feeder services in order to capture residents in Durham and reduce the need for auto trips to stations. It has been assumed in the forecasting exercise that a 20% transit mode share of all cross-boundary trips could be achieved. A 20% mode split to transit is a realistic estimate given the current "state" of transit and transit facilities in the study area, and future plans for "expansion" by the appropriate transit authorities. A further discussion of transit opportunities is provided in **Section 3.3**.

Other Modes of Travel

Durham Region has participated in the development of a GTA HOV Strategy which would provide a combined highway/arterial HOV network. The implementation of this strategy has the potential to achieve and exceed the 1.20 auto occupancy assumed in the travel forecasting model. This is particularly important since the auto occupancy in the Highway 7 corridor today (1995) is 1.13.

Growth Management

The population and employment forecasts used for Durham Region in the travel forecasting represent a maintenance of existing (1991) self-containment. Since 1991 Durham's employment to population ratios in Pickering and Ajax have decreased significantly. Therefore, assuming a continuation of 1991 conditions, in fact means an improvement of self-containment in Durham Region in the long term.

Conclusions

It has been estimated that for the 2011 planning horizon, automobile demand as identified could possibly be reduced by between five and ten percent through the application of the appropriate TDM strategies. These estimates of travel reduction are based on work undertaken in Ontario municipalities in the last few years, specifically Durham Region, Ottawa-Carleton, London, and Niagara Falls. This level of reduction would have little or no impact on the results of this study relative to future transportation system capacity deficiencies and system requirements.

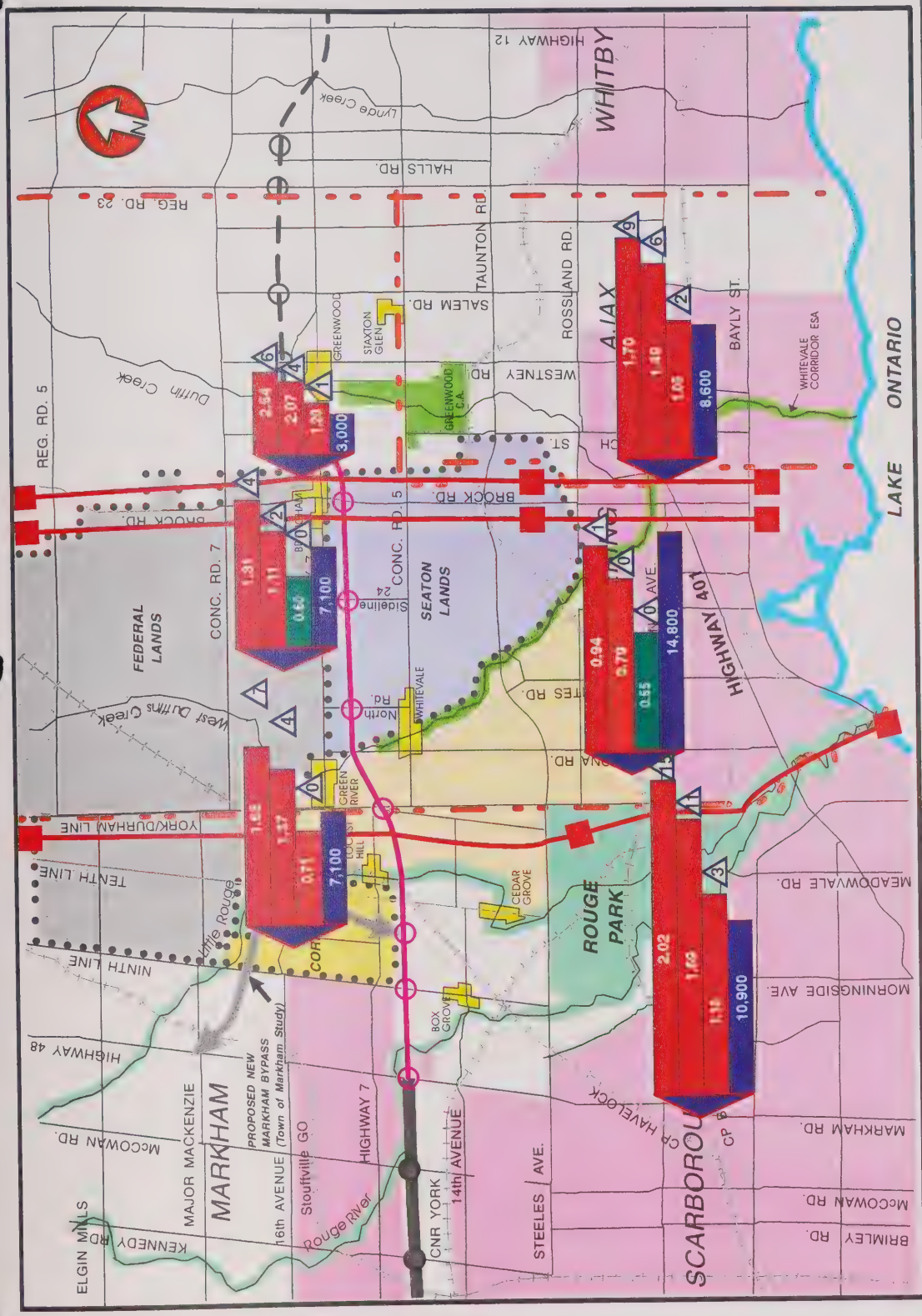
Increased use of transit and greater reliance on practical and workable TDM strategies will be a key to reducing future travel demand and in particular auto use across the Metro-York/Durham boundary. The travel forecasting has been based on assumptions of reduced auto use through the measures described above.

2.3.4 Transportation System Deficiencies

Exhibits 2.3.4 (a) and 2.3.4 (b) summarize the screenline analysis for the three horizon years presented in the analysis for auto travel demands. **Exhibit 2.3.4 (a)** displays the analysis for a scenario with Highway 407 extending to Markham Road, while **Exhibit 2.3.4 (b)** shows analysis of a scenario with Highway 407 extending to Brock/Highway 7 as a 4-lane "interim" freeway facility.

2.3.4.1 Deficiencies in 1998

The person trip demands on the transit system (mainly the GO line) are not expected to change significantly in the next two years. As 1995 cordon counts have shown, peak period GO ridership has not changed significantly since 1991 and no additional capacity can be added to the corridor without major infrastructure investment. Increases in demand, by 1998, for other transit services can be handled by existing services (GO Bus); however, it must be recognized that buses are subjected to the same congestion issues as other road users.



FUTURE A.M. PEAK HOUR AUTO TRIP DEFICIENCIES AND ARTERIAL LANE DEFICIENCIES WITH 4 LANE HWY 407 TO BROCK ROAD

HIGHWAY 407 / TRANSITWAY MARKHAM ROAD EASTERLY TO HIGHWAY 7 EAST OF BROCK ROAD

In terms of screenline problems, when Highway 407 Central opens to Markham Road at the start of 1998, there will be deficiencies across the Metro-York/Durham boundary, even with the completion of the widening of Highway 401 to 12 lanes as far as Brock Road. Along the Highway 7 corridor there will be a deficiency in roadway capacity, the equivalent of 1-2 lanes of arterial capacity (one-way westbound). This estimate of deficiency is based on an auto occupancy of 1.2, although it is known that the actual auto occupancy at the boundary is lower at 1.13, based on a 1995 Cordon count. Therefore, the estimate of cross-boundary auto capacity deficiencies, in reality, is likely understated. The Highway 401 widening is the only "programmed" improvement which will add capacity to the roadways crossing the boundary.

Based on 1998 projections, no deficiencies in vehicular capacity will exist at the boundary along the Highway 7/407 Corridor if Highway 407 is extended to Brock/Highway 7.

With the opening of Highway 407 Central to Markham Road in 1998, there will be a number of associated local traffic problems, including:

- Markham Road between Highway 7 and Highway 407 will be *extremely congested*;
- Traffic is expected to increase on 14th Avenue through the community of Box Grove;
- Highway 7 traffic is expected to increase east of Markham Road into Durham Region affecting the communities of Green River, Locust Hill, Brougham, and Greenwood. Residents in these communities are already concerned about the levels of traffic travelling on Highway 7 through their communities; and
- Traffic is expected to increase on Whitevale Road in Pickering as traffic attempts to reach Highway 407, resulting in increased traffic through the community of Whitevale. Again, Whitevale residents are already concerned about the level of traffic that uses Concession Road 5 through the Hamlet and are currently working with the Town of Pickering to implement a "traffic calming" plan to reduce or "calm" traffic flow through the community.

Summary

In 1998 there will be some cross-boundary capacity deficiencies without the extension of Highway 407 to the east of Markham Road; however, the greatest impact associated with not extending Highway 407 would be in local roadways in the area of Markham Road and Highways 7 and 407 and within the communities and hamlets in the Highway 7/407 Corridor east of Markham Road. Suggestions by some residents in Markham to terminate Highway 407 Central at a point west of Markham Road (such as McCowan Road) would **not** result in reductions to traffic volumes on Markham Road or in the communities or hamlets in the Highway 7/407 corridor.

West of Brock Road along the Highway 401 corridor, there will be no overall deficiency across the screenline without Highway 407 extended to Brock/Highway 7. However, along the Highway 7/407 corridor there will be a deficiency of at least one arterial lane. With the construction of Highway 407, there will be no capacity deficiencies across this screenline.

Across the entire screenline east of Brock Road, with and without Highway 407, there will be a total capacity deficiency of three arterial lanes.

2.3.4.2 Deficiencies at 2011

By 2011, there are expected to be **major** capacity deficiencies crossing the Metro-York/Durham boundary for both person and road demands.

Based upon the demand forecasting conducted as part of this study, transit ridership is estimated to increase by more than 50% in the peak hour across the boundary over 1998 volumes. This increase assumes that modal split to transit will remain in the order of 20% crossing the boundary. All of this increase cannot be handled by GO Transit; indeed a significant portion of this travel is not destined to downtown Toronto to which GO Rail is oriented. The transit trip destinations, other than to Downtown Toronto, are widely dispersed. However, it is expected that high density employment nodes will continue to be developed along the Highway 7/407 corridor through Markham and Vaughan, thereby creating opportunities for a major transit corridor to capture transit riders. In order to achieve the transit ridership projected by 2011, significant changes to the existing transit infrastructure will be required.

Major auto capacity deficiencies will exist at the Metro-York/Durham boundary by 2011. ***Even with Highway 407 as a four lane facility across the boundary (i.e. to Brock Road/Highway 7)***, the total deficiency in capacity across the Metro-York/Durham boundary will be the equivalent of 15 arterial lanes (one-way westbound) across the entire screenline. In the Highway 7/407 corridor alone, the forecasting results show that there will be a capacity deficiency of 4 arterial lanes (one-way). It should be noted that there are no opportunities south of Steeles Avenue to provide additional arterial or highway, ***therefore, the demand must be handled in the Highway 7/407 corridor***. The 15 arterial lane deficiency (equivalent to about 6 freeway lanes one-way) will need to be handled through a combination of facilities, most likely including Highway 407 and possibly provision of additional arterial capacity.

West of Brock Road, along the Highway 401 corridor, the analysis reveals that there will be no capacity deficiency across the screenline with or without the extension of Highway 407; however, this is misleading as traffic at this location on Highway 401 will be affected by the capacity deficiency at the Metro-York/Durham boundary. Even with the extension of Highway 407 to Brock/Highway 7, there will be major auto capacity deficiencies at both the boundary and east of Brock Road along the Highway 407 and Highway 7 corridors.

The entire screenline east of Brock Road will have significant auto deficiencies by 2011, equivalent to a total of 10 arterial lanes (one-way, westbound) with or without the extension of Highway 407. Although the forecasting results show a deficiency in the Highway 401 corridor, there are limited opportunities for meeting the demands in this corridor and, therefore, the demands will need to be satisfied primarily, in the Highway 7/407 corridor.

These results suggest that significant additional road and transit capacity will be required at both the Metro-York/Durham boundary and east of Brock Road by 2011, primarily in the Highway 7/407 corridor.

Summary

Transportation demand within the Study Area will increase between 1998 and 2011 to the point that, even with the extension of Highway 407 to Brock Road, there will be major capacity deficiencies across the Metro-York/Durham Boundary and at Brock Road in both the Highway 7/407 and Highway 401 corridors. As at 1998, there will be major impacts in local communities in the Region of Durham resulting from traffic infiltration if Highway 407 is not extended to the east. There are limited opportunities to effect capacity increases in the Highway 401 corridor and future system improvements must focus on the Highway 7/407 corridor, both east and west of Brock Road.

By 2011, the transit demand will be such that higher order transit facilities may be warranted. Again, the only potential for such facilities will be in the area of Highway 407.

2.3.4.3 Deficiencies at 2021

The major transit and auto deficiencies projected by 2021 are a continuation of patterns seen in the 2011 projections. Both transit and auto travel demand projections show significant increases. By 2021, all screenlines will be at or significantly over capacity. Only major shifts in travel, employment, trip making patterns will reduce the deficiencies expected.

As with 2011, transit ridership projections can only be met with major changes to the transit infrastructure. The provision of transit in the Highway 7/407 corridor is essential to link Durham with York Region and north Metro through high quality transit connections.

Auto deficiencies in the Highway 401 and Highway 7/407 corridors are expected to be 15 and 7 arterial lanes respectively at the Metro-York/Durham boundary by 2021, even with a four lane Highway 407 facility extended to Brock Road/Highway 7.

Major deficiencies also are expected east of Brock Road with a total of 15 lanes of arterial roadway capacity required across the entire screenline, with Highway 407 extended to Brock Road.

Summary

The transportation demand analysis indicates that significant additional road and transit capacity will be required at both the Metro-York/Durham boundary and east of Brock Road by 2021. In order to satisfy the future demands, Highway 407 will have to be widened and a dedicated higher order transit facility will be needed in the Highway 407 Corridor.

2.3.4.4 Deficiencies beyond 2021

While no model was developed for a scenario beyond 2021, based on the best information available in the Hemson forecasts, there will continue to be major travel interactions between Durham, York, and Metropolitan Toronto. The GTA is expected to continue to be a major focus of industrial and business activity in Ontario. Therefore, while travel patterns may change and be mitigated by changes affected by TDM, TSM, and growth management strategies, the travel *demands in the both the Highway 401 and Highway 7 corridors will continue to grow*. Should the Pickering Airport be

developed, there will be a major shift in travel demands in the Highway 7 corridor. If the airport is developed as a regional airport, there will be traffic associated with airport operations as well as passenger and cargo operations. If development of an international airport occurs, there would be high growth in airport related traffic and major changes in surrounding land uses, along with airport related industrial development, thereby creating a major employment centre or node. Under both scenarios, there will be a travel demand in the Highway 7 corridor which could not be served, given the current planned transportation infrastructure.

2.4 OTHER CONSIDERATIONS

In assessing the need for an extension of Highway 407 east of Markham Road, there are a number of issues that must be considered. These issues relate to ongoing studies, current developments in both Markham and Durham, environmental issues, and economic issues.

Official Plan Consistency

Both the Region of Durham and Draft Town of Pickering Official Plans recognize the preferred technical alignment for Highway 407 East. Both Plans also identify the need for a higher order transit facility along the Highway 407 corridor. There are, however, some major unresolved issues with respect to other critical roadway links within the Town of Pickering.

The Durham Official Plan currently depicts east-west arterial roadway facilities across the Metro-York/Durham boundary connecting Rossland Road in Durham to Finch Avenue in Metropolitan Toronto (Scarborough), and the 5th Concession in Durham to 14th Avenue in York (Markham). Both of these roadway links are not included in the Pickering Official Plan. Previous studies have indicated that these links could provide additional needed roadway capacity across the Metro-York/Durham boundary. If these facilities are not constructed in the future, there will be additional demands placed on Highway 407.

The Draft Pickering Official Plan also shows interchanges and flyovers in locations different than those shown in the Highway 407 Route Planning Study. There has been no official request by the Town to MTO to investigate the changes and the Region, which has approval authority over the Official Plan, is aware of these differences and potential implications.

At the time of this writing, staff of the Region of Durham and The Town of Pickering are continuing to meet to resolve the differences between the two Official Plan documents.

Growth in Durham and GTA

Population growth in the GTA is a function of migration and natural growth. With stable natural growth and a net gain due to migration, the population of the GTA will continue to increase in the future. Durham Region, with its attractive qualities for residential, industrial/commercial and tourism growth, is well positioned to attract future growth. However, this growth is being limited by inadequate transportation capacity, particularly in an east-west direction across the Metro-York/Durham boundary.

Economic Issues for Durham and the GTA

Existing industries in Durham Region, which depend on convenient truck access (e.g. General Motors), are facing increasing congestion on Highway 401. Some of this congestion will be relieved by the widening of Highway 401, currently under construction. However, an east-west bypass of Metropolitan Toronto is needed to offer sufficient relief of present and expected congestion levels. New industrial and employment opportunities in the Region will require access and proximity to the provincial freeway system, particularly if the Region is to achieve its significant employment objectives.

As discussed in **Section 2.2.3**, congestion-related delays to commercial vehicles add significantly to the cost of moving goods in and through the GTA.

Metropolitan Toronto's forecast increase in employment, (32% increase by 2021) will have a substantial impact in terms of attracting significant travel demands from the surrounding regions, thereby increasing cross-boundary travel demand, further increasing congestion-related costs to goods and services.

Steeles Avenue East Widening

In 1994, the Municipality of Metropolitan Toronto successfully completed a Class Environmental Assessment for the widening of Steeles Avenue from McCowan Road to York/Durham Line (York Road 30). In 1995, Metro Transportation initiated construction on Steeles Avenue. Metro has indefinitely postponed completion of the widening from two to four lanes. The Steeles Avenue - Taunton Road link represents a critical east-west roadway link across the Metro-York/Durham boundary. Delays in completing the widening will have a significant impact on cross-boundary travel.

Freeway Spacing and Population/Employment Cells

The Highway 407 Overview Study provided some detailed analysis of the freeway and arterial road network in order to understand the development of road networks and how these influence developing road networks in the future. The conclusions of that study have been reviewed with respect to freeway spacing and the following is noteworthy.

To handle the traffic demands of urbanized areas, experience in the GTA has shown the need to develop:

1. An arterial grid system at 2 kilometre spacing; and
2. A freeway grid network with 8 to 10 kilometre spacing.

These are physical characteristics of the road network in the GTA urban area required by trip making characteristics of the population and employment areas within the grid system. It is important to understand that there are high levels of congestion in the GTA today, even with these spacings of the freeway and arterial grid system.

Empirical evidence in the more established parts of the GTA shows the "cells" (those areas bounded by freeways on all four sides) in the freeway grid network should have a maximum population levels of about 200,000 to 300,000 and/or employment levels of 100,000 to avoid exceeding the capacity of the transportation network. The Study Area under review includes a roadway network that fails to satisfy the above physical characteristics or criteria

2.5 PROBLEM AND NEEDS STATEMENT

The key problems and needs identified through a detailed assessment of transportation conditions, existing and future, are summarized below:

- There is currently a need for additional a.m. and p.m. peak period roadway capacity across the Metro-York/Durham boundary. The existing capacity deficiency will continue to increase over time and, as mentioned, will not be satisfied by the widening of Highway 401 to 12 lanes;
- In 1998, with the termination of Highway 407 at Markham Road (Highway 48), existing capacity and operational constraints on Markham Road, Highway 7, 14th Avenue, and Steeles Avenue will be exacerbated. Communities along the Highway 7 corridor will be affected by spillover congestion, including Markham Village, Green River, Whitevale, Locust Hill, and Box Grove. To the east, Brougham and Greenwood will also be significantly affected by congestion on Highway 7;
- At the screenline east of Brock Road there will be a deficiency at the 1998 planning horizon of more than 2 arterial lanes which will increase over time;
- Construction of the partial extension of Highway 407 to east of Brock Road as a four lane facility, in addition to the Highway 401 improvements, will not alone address Metro-York/Durham boundary capacity requirements at the 2011 and 2021 planning horizons. There will be a need to upgrade Highway 407 (10 lanes) and extend it beyond Brock Road;
- Given the prevailing transit infrastructure, the available transit capacity across the Metro-York/Durham boundary and the limited plans to upgrade any of the existing systems in the short term (i.e. up to 2011), it is not practical to assume that a major change in the percentage of trips made by transit (mode split) will change dramatically. In fact, the transit facilities may not be able to handle the projected demand. As a consequence, estimates of roadway capacity deficiencies across the Metro-York/Durham boundary may actually be understated for short-term projections;

- In order to accommodate future transit demands, significant improvements to the transit infrastructure will be required. This could include provision of higher order transit service across the Metro-York/Durham boundary. The only corridor suitable for such service is the proposed Highway 407 corridor. As a result, the Highway 407 corridor should include provision for higher order transit service (i.e. busway, LRT, etc.); and
- At the screenline east of Brock Road, at the 2011 and 2021 planning horizons, there will also be major deficiencies in capacity. It is fundamental to note that, although further widening of Highway 401 east of Brock Road may improve conditions in the Highway 401 corridor, such an improvement will not resolve capacity constraints in the Highway 407 corridor.

It is clear from the transportation analysis summarized in this document that:

- A balanced transportation plan comprised of road, transit, and other TDM strategies will be required to deal with future transportation demands, particularly across the Metro-York/Durham boundary;
- Short and long term transportation deficiencies will not be mitigated by the implementation of TSH or TDM strategies. Even non-structural strategies to spread peak hours are not practical as the peak period already lasts for approximately three hours;
- Capacity constraints may be understated for the following reasons:
 - The analysis summarized in this report is for the a.m. peak. However, p.m. peak hour conditions tend to be more severe;
 - The auto occupancies used in the analysis (1.2 persons per vehicle) may be optimistic given that auto occupancies have been dropping across the Metro-York/Durham boundary;
 - Unless there are major improvements to the transit infrastructure, transit ridership projections may not be achievable which may result in increased auto demand; and
 - Failure to address existing capacity constraints may result in a failure of the Region of Durham to achieve their employment projections which in turn will affect their ability to achieve their self-containment goals. This will in turn result in greater cross-boundary auto demands;
- It is fundamental to recognize that the implementation of the Highway 407 Extension represents only one component of a package of transit, roadway, and operational improvements which will be required to satisfy travel demands across the Metro-York/Durham boundary and within Durham itself;
- From a transportation perspective, the extension of Highway 407 into Durham is clearly needed as one component to improve screenline capacity. Uncertainty with respect to development in Durham, the additional systems improvements that may be effected in the next two decades and the success of TSM strategies suggests that an extension of Highway 407 be undertaken immediately to provide at least a basic 4-lane freeway facility;

- It is fundamental that, as a result of anticipated and significant person-capacity deficiencies at both the Metro-York/Durham and Brock screenlines, the right-of-way for Highway 407 be protected to permit an ultimate 10-lane facility (consistent with future protection plans for Highway 407 Central) and that property be protected for a future high order transit system adjacent to the roadway; and
- Highway 407 must be extended beyond Brock Road in the future to satisfy future transportation requirements in the Region of Durham.

CHAPTER 3

ALTERNATIVES TO THE UNDERTAKING

3.0 ALTERNATIVES TO THE UNDERTAKING

Provided in this Chapter of the report is a description, assessment and evaluation of the planning alternatives which could be implemented to resolve the transportation/traffic problems resulting from the termination of Highway 407 at Markham Road and the current and projected mobility problems across the Metro-York/Durham boundary. These alternatives essentially address the transportation objectives articulated in **Chapter 2.0** of the report.

3.1 TRANSPORTATION SYSTEM PLANNING ALTERNATIVES

3.1.1 The Do Nothing Alternative

This alternative was included to provide a base to permit comparison with the other planning alternatives. Under this planning alternative, no measures to improve or increase vehicular and/or person trip capacity in and through the Durham Region and across the Metro-York/Durham boundary were considered. The "Do Nothing", or base alternative, assumes that Highway 407 will be completed and open to Markham Road from the west, in 1998. It should be noted that the Highway 401 widening to Brock Road in Pickering, currently under construction, has also been included in the "Do Nothing" or base scenario.

3.1.2 Improve Transit Services (Interregional, Regional, Intermunicipal, GO and Rail Transit)

This alternative solution would include, but not be limited to, the following opportunities:

- The expansion of GO Rail services along the Lakeshore Corridor including an extension into Clarington and/or;
- The establishment of commuter rail service on CP Rail's Havelock or Belleville Subdivisions;
- The expansion of municipal transit service (i.e. TTC, Markham, Pickering etc.) and the establishment of regional transit systems in Durham and York;
- The establishment of interregional transit services along the Highway 401 corridor;
- The implementation of improved interregional service along the Highway 407 corridor; and
- Greater use of existing heavy rail by commuters travelling between Durham and other destinations to the west in the GTA.

3.1.3 Implement Transportation System Management Measures (TSM)

Transportation System Management (TSM) measures include various methods of maximizing existing infrastructure capacity. Typical TSM measures include the implementation of improved traffic signal timing equipment, improved signal timing and phasing, widening of intersections to accommodate turning lanes, utilization of Intelligent Traffic Systems (eg. Highway 401 Freeway Traffic Management System), etc. Such typical TSM improvements were considered for the existing major transportation routes crossing the Metro-York/Durham boundary and within

Durham Region.

3.1.4 Promote Transportation Demand Management Improvements (TDM)

TDM strategies can be grouped or aggregated into a number of broad categories including, voluntary efforts (ride sharing, trip chaining, improved telecommunications, activities scheduling, etc.), regulatory efforts (parking controls, right-of-way reallocation, preferential treatment for HOV's, auto disincentives, etc.) and growth/land management. For the purpose of this Study, growth/land management has been dealt with as a separate planning alternative (See **Section 3.1.6**).

Although a broad range of TDM strategies currently exist, there are some which would not affect mobility requirements across the Metro-York/Durham boundary; there are, however, several which may have some impact on travel demand within the subject Study Area. These measures include:

- Trip sharing;
- Trip chaining (several trips made as part of a home-work or work-home trip, such as shopping, day-care, etc.);
- HOV system development; and
- Telecommuting, etc.

3.1.5 Upgrade Arterial/Municipal Roadways

The upgrading of existing regional arterials and/or municipal roadways would consist of road widening to increase the "through" lane capacity of existing facilities. This could also include the widening of existing roadways to provide for HOV or transit only lanes to increase the overall person trip capacity across the Metro-York/Durham boundary. A widening of Highway 7 was also considered in the context of the assessment of "planning alternatives".

3.1.6 Encourage Community Growth Management

Although this could be considered a TDM strategy, this issue was given separate status to reflect its future potential in terms of reshaping or influencing the trip making characteristics of Durham residents. Management of growth within Durham Region would consist of implementing planning and development strategies or policies to increase the employment to population and live/work ratios within Durham, thereby, reducing the number of work trips across the Metro-York/Durham boundary. The Region of Durham's Official Plan contains policies and goals directed at increasing the Region's *self containment* in terms of commuter travel demands.

3.1.7 Extend Highway 407 Easterly (With protection for transitway facilities)

The extension of Highway 407 easterly would involve the construction of a new section of Highway 407 easterly from Markham Road. The Highway 407 extension would initially consist of a four lane fully access controlled highway within a corridor protected to allow an ultimate ten

lane cross section with a "higher order" transitway facility which would then parallel the roadway.

3.2 ASSESSMENT OF THE PLANNING ALTERNATIVES

The initial task in the assessment was to develop criteria based on the various planning alternatives being considered. The development of criteria was completed in a two-step process which included the identification of six criteria groups followed by the selection of sub factors within each criteria group. The criteria groups were selected to describe capacity issues and the distinct areas of the environment to be assessed:

- Transportation;
- Natural Environment;
- Social Environment;
- Economic Environment;
- Cultural Environment; and
- Engineering.

Within each criteria group, sub factors were established to describe and measure the impact of the planning alternatives. The sub factors used for assessing the planning alternatives are summarized in **Table 3.2.1**.

<p align="center">TABLE 3.2.1 SUB FACTORS USED IN THE ASSESSMENT OF TRANSPORTATION SYSTEM PLANNING ALTERNATIVES</p>	
CRITERIA/SUB FACTORS	DESCRIPTION
TRANSPORTATION	
Accommodation of Future Demand <ul style="list-style-type: none"> • person-capacity • vehicular capacity 	Ability to accommodate short and long term east-west capacity requirements across the Metro-York/Durham boundary.
Safety	Impact on the vehicular and pedestrian accident potential on the existing road network and through local communities.
Recreational Traffic Demands	Improvement of potential for cross boundary recreational vehicle travel.
Emergency Services	Impact on the response times of emergency vehicles.
NATURAL ENVIRONMENT	
Vegetation	Physical and stormwater drainage impacts on existing vegetation resources.
Wildlife Habitat	Physical impact to existing wildlife habitat areas.
Fisheries	Impact to existing fisheries.
SOCIAL ENVIRONMENT	
Property Impacts	Physical impact on existing buildings and properties.
Community Impacts <ul style="list-style-type: none"> • Traffic Infiltration 	Impact on existing communities and community traffic related problems such as undesirably high traffic problems within residential communities on "local" and "collector" roadways.
Agricultural Impacts	Physical impact/displacement to existing agricultural lands.
Noise Impacts	Potential affects to noise levels in residential communities.

TABLE 3.2.1
SUB FACTORS USED
IN THE ASSESSMENT OF TRANSPORTATION SYSTEM PLANNING ALTERNATIVES

CRITERIA/SUB FACTORS	DESCRIPTION
Aesthetics	Impact on aesthetics, i.e. area landscapes.
ECONOMIC ENVIRONMENT	
Re-development/development Potential	Future re-development and development (commercial and residential) potential and opportunities for growth in tourism in the Durham Region and surrounding communities.
Satisfy Official Plans Goals, Objectives and Policies	Consistency with existing policies regarding future transportation networks, population and employment projections.
Accessibility/Impact to Employment Areas	Ability to access existing and future employment areas within Durham and across the Metro-York/Durham boundary as well as the impact on the business community and working public.
CULTURAL ENVIRONMENT	
Built Heritage Structures	Potential impact to built heritage structures.
Archaeological Resources	Potential impact to archaeological sites.
ENGINEERING	
Impact on Capacity During Construction	Impact on roadway capacity during construction activities.
Utility Conflicts	Impact on existing utilities and services during and after construction.

Included in **Table 3.2.2** is a comprehensive assessment undertaken for each of the planning alternatives listed above. The assessment matrix assists in making the decision procedure comprehensible and ensures that the conclusions and recommendations are achieved in a clear and logical fashion and that all transportation and environmental issues sensitive to this Study are given consideration. As previously discussed, the "Do Nothing" alternative was also evaluated for comparison purposes.

TABLE 3.2.2
ASSESSMENT OF TRANSPORTATION SYSTEM PLANNING ALTERNATIVES

CRITERIA	DO NOTHING	IMPROVE TRANSIT SERVICES (New Interregional, Regional, Intermunicipal, GO and Rail Transit)	IMPLEMENT TRANSPORTATION SYSTEM MANAGEMENT MEASURES (TSM)	PROMOTE TRANSPORTATION DEMAND MANAGEMENT IMPROVEMENTS (TDM)	UPGRADE ARTERIAL/MUNICIPAL ROADWAYS	GROWTH MANAGEMENT (Increased self containment in the Region of Durham)	EXTEND HIGHWAY 407 EASTERLY (With protection for transitway facilities)
TRANSPORTATION							
<p>Accommodation of Future Demand</p> <ul style="list-style-type: none"> person-capacity vehicular capacity 	<ul style="list-style-type: none"> Existing transportation infrastructure does not have sufficient capacity to accommodate short or long term east-west demands both at the Metro-York/Durham boundary and to the east of Brock Road in the Region of Durham. Extreme congestion on entire transportation infrastructure will result and affect the ability to provide adequate services on both roads and transit. Does not resolve traffic related concerns at Markham Road that will result following completion of Highway 407 central. Markham Road from Highway 7 to Highway 407 will be extremely congested. 	<ul style="list-style-type: none"> Will provide some additional person-capacity across the screenline, although the existing transportation infrastructure does not have sufficient capacity to accommodate short or long term east-west demands both at the Metro-York/Durham boundary and to the east of Brock Road in the Region of Durham. Even if 100% of downtown Toronto destined trips use transit, there will be a minor reduction on total number of cross boundary auto trips. Existing and future trip making characteristics (many origins and destinations) of Durham residents precludes the ability to satisfy travel demands through the provision of additional transit service. Does not resolve traffic related concerns at Markham Road that will result following completion of Highway 407 central. Markham Road from Highway 7 to Highway 407 will be extremely congested. Level of transit demand may require separate right-of-way. Consistent with transportation system improvements defined in previous long range transportation planning studies. 	<ul style="list-style-type: none"> Will provide only very limited site specific capacity improvements for autos, trucks and transit vehicles. Little or no increase in cross boundary person-capacity. Existing transportation infrastructure with TSM improvements, will not have sufficient capacity to accommodate short or long term east-west transit or auto demands both at the Metro-York/Durham boundary and to the east of Brock Road in the Region of Durham. Does not resolve traffic related concerns at Markham Road that will result following completion of Highway 407 central. Markham Road from Highway 7 to Highway 407 will be extremely congested. Traffic congestion will affect viability of existing transit services and TDM opportunities. 	<ul style="list-style-type: none"> May result in some minor reduction in vehicle volumes; however, many TDM techniques may not impact cross-boundary travel in general or auto trips specifically. That is, the length of trips typically made by Durham residents are not conducive to the application of some TDM measures. The amount of reduction in auto traffic is difficult to quantify but may be in the range of 5 to 10 % in the longer term. Little or no increase in cross boundary person-capacity. More opportunity to reduce the number of "internal" auto trips. Existing transportation infrastructure with TDM strategies, will not have sufficient capacity to accommodate short and long term east-west demands both at the Metro-York/Durham boundary and to the east of Brock Road in the Region of Durham. Does not resolve traffic related concerns at Markham Road that will result following completion of Highway 407 central. Markham Road from Highway 7 to Highway 407 will be extremely congested. Traffic congestion will affect viability of existing transit services and TDM opportunities. 	<ul style="list-style-type: none"> The Construction of new roadways through the Rouge Park south of Steeles Avenue is not consistent with the Rouge Park Management Plan. May provide some limited short term person-capacity improvements; however, there are limited opportunities to upgrade/extend existing arterial roadways to satisfy long term east-west cross boundary capacity requirements. Upgrading the arterial/ municipal roadways will not resolve short or long term east-west travel demands. Does not resolve traffic related concerns at Markham Road that will result following completion of Highway 407 central. Markham Road from Highway 7 to Highway 407 will continue to be congested. Significant additional cross boundary capacity required to satisfy future travel demands. Some arterial Road improvements are identified in previous long range transportation planning studies. Traffic congestion will affect viability of existing transit services and TDM opportunities. 	<ul style="list-style-type: none"> Even with very optimistic self containment objectives for Durham (employment to population ratio approx. 0.50) there will be significant deficiencies in cross boundary person-capacity. Does not resolve traffic related concerns at Markham Road that will result following completion of Highway 407 central. Markham Road from Highway 7 to Highway 407 will be extremely congested. May result in some longer term benefits; however, short term benefits are non-existent. Current trends indicate that the employment to population ratio in Durham is currently decreasing, not increasing. Traffic congestion will affect viability of existing transit services and TDM opportunities. 	<ul style="list-style-type: none"> In comparison with the other planning alternatives, will provide significant additional east-west cross boundary capacity and relief to existing congested roadways in Durham, Metro and York. Relief to congestion on existing roadways could result in short term benefits for existing transit services. The interim extension (4 lanes) will resolve many traffic related concerns at Markham Road that will result following completion of Highway 407 central. The interim extension (4 lanes) will mitigate short term capacity deficiencies across the Metro-York/Durham boundary. However, the easterly extension of Highway 407, as a 4-lane facility, will not be able to satisfy all cross boundary traffic demands in the longer term. May affect the scheduling for future arterial improvements although it is recognized that all roads in the Draft Regional Official Plan will be required in the longer term. Consistent with transportation networks defined in previous long range transportation planning studies. In the longer term, widening of the facility (up to 10 lanes) will greatly enhance the ability of the transportation system to satisfy traffic demands in and through the Region of Durham and across the Metro-York/Durham boundary. The transitway will permit the accommodation of future transit demands which cannot be satisfied by other "planning" alternatives. Neither the Highway or the transitway, by themselves will have the ability to satisfy future transportation requirements.

TABLE 3.2.2
ASSESSMENT OF TRANSPORTATION SYSTEM PLANNING ALTERNATIVES

CRITERIA	DO NOTHING	IMPROVE TRANSIT SERVICES (New Interregional, Regional, Intermunicipal, GO and Rail Transit)	IMPLEMENT TRANSPORTATION SYSTEM MANAGEMENT MEASURES (TSM)	PROMOTE TRANSPORTATION DEMAND MANAGEMENT IMPROVEMENTS (TDM)	UPGRADE ARTERIAL/MUNICIPAL ROADWAYS	GROWTH MANAGEMENT (Increased self containment in the Region of Durham)	EXTEND HIGHWAY 407 EASTERLY (With protection for transitway facilities)
Safety	<ul style="list-style-type: none"> Increasing traffic volumes on the existing transportation network may result in an increase in the vehicular as well as pedestrian accident potential on roadways. Potential for reduced safety will result in communities which experience increasing traffic volumes, i.e. Whitevale, Box Grove, Locust Hill, Brougham, Green River, etc. 	<ul style="list-style-type: none"> Increasing traffic volumes on the existing transportation network may result in an increase in the vehicular as well as pedestrian accident potential on roadways. Transit vehicles will be exposed to increased traffic volumes and may realize increased accident potential. Improving transit service will not result in a decrease in traffic volumes in local communities, i.e. Whitevale, Box Grove, Locust Hill, Brougham, Green River, etc. 	<ul style="list-style-type: none"> Site specific and minor changes in capacity will result in localized safety improvements. Increasing traffic volumes on the existing transportation network may result in an increase in the vehicular as well as pedestrian accident potential on roadways. Transit vehicles will be exposed to increased traffic volumes and may realize increased accident potential. TSM strategies will not result in a decrease in traffic volumes in local communities, i.e. Whitevale, Box Grove, Locust Hill, Brougham, Green River, etc. 	<ul style="list-style-type: none"> Increasing traffic volumes on the existing transportation network may result in an increase in the vehicular as well as pedestrian accident potential on roadways. Transit vehicles will be exposed to increased traffic volumes and may realize increased accident potential. TDM strategies will not result in a decrease in traffic volumes in local communities, i.e. Whitevale, Box Grove, Locust Hill, Brougham, Green River, etc. 	<ul style="list-style-type: none"> The provision of additional capacity and reduced vehicle delays, may result in a decrease in the vehicular as well as pedestrian accident potential on roadways. Transit vehicles will be exposed to increased traffic volumes and may realize increased accident potential. Just upgrade arterial/municipal roadways will not result in a decrease in traffic volumes in local communities, i.e. Whitevale, Box Grove, Locust Hill, Brougham, Green River, etc. 	<ul style="list-style-type: none"> Increasing traffic volumes on the existing transportation network may result in an increase in the vehicular as well as pedestrian accident potential on roadways. Transit vehicles will be exposed to increased traffic volumes and may realize increased accident potential. Growth management strategies will not result in a decrease in traffic volumes in local communities, i.e. Whitevale, Box Grove, Locust Hill, Brougham, Green River, etc. 	<ul style="list-style-type: none"> The provision of significant additional capacity and reduced vehicle delays, may result in a decrease in the vehicular as well as pedestrian accident potential on roadways. Reduced risk in local communities in comparison with the other planning alternatives due to displacement of traffic. Well designed freeways typically have lower accident rates than arterials.
Recreational Traffic Demands	<ul style="list-style-type: none"> No improvement for recreational trips. Motorists will continue to experience congestion and delays. 	<ul style="list-style-type: none"> No improvement for recreational trips. Motorists will continue to experience congestion and delays. 	<ul style="list-style-type: none"> No improvement for recreational trips. Motorists will continue to experience congestion and delays. 	<ul style="list-style-type: none"> No improvement for recreational trips. Motorists will continue to experience congestion and delays. 	<ul style="list-style-type: none"> Some short term improvement may be realized for recreational trips. 	<ul style="list-style-type: none"> No improvement for east-west recreational trips. 	<ul style="list-style-type: none"> Significant improvement, over the other planning alternatives now and in the future for recreational travel provided that the facility is extended and widened to accommodate future travel demands.
Emergency Services	<ul style="list-style-type: none"> Failure to improve the transportation infrastructure will result in increased congestion on the local transportation network increasing response times for emergency service vehicles. 	<ul style="list-style-type: none"> Just improving transit service will not reduce existing levels of congestion on the local transportation network resulting in increased response times for emergency service vehicles. 	<ul style="list-style-type: none"> TSM improvements will not affect the growth of traffic and the level of congestion on the local transportation network. This will result in increased response times for emergency service vehicles. 	<ul style="list-style-type: none"> TDM improvements will not affect traffic volumes to the point that congestion will be relieved on the network. The effect of this will be increased response times for emergency service vehicles. 	<ul style="list-style-type: none"> Arterial/municipal roadway improvements will not provide the necessary capacity on the transportation network. As a result of congestion on the local transportation network, increased response times will be experienced by emergency service vehicles. 	<ul style="list-style-type: none"> Growth management strategies will not affect traffic volumes to the point that congestion will be relieved on the network. The effect of this will be increased response times for emergency service vehicles. 	<ul style="list-style-type: none"> In comparison to the other planning alternatives, there will be an improvement in response times for emergency service vehicles as a result of additional east-west capacity.

TABLE 3.2.2
ASSESSMENT OF TRANSPORTATION SYSTEM PLANNING ALTERNATIVES

CRITERIA	DO NOTHING	IMPROVE TRANSIT SERVICES (Interregional, Regional, Intermunicipal, GO and Rail Transit)	IMPLEMENT TRANSPORTATION SYSTEM MANAGEMENT MEASURES (TSM)	PROMOTE TRANSPORTATION DEMAND MANAGEMENT IMPROVEMENTS (TDM)	UPGRADE ARTERIAL/MUNICIPAL ROADWAYS	GROWTH MANAGEMENT (Increased self containment in the Region of Durham)	EXTEND HIGHWAY 407 EASTERLY (With protection for transitway facilities)
NATURAL ENVIRONMENT							
Vegetation	<ul style="list-style-type: none"> No physical impacts. Increased traffic demands on roadways in the local area will be realized. This may require improved stormwater management facilities to treat roadway runoff; stormwater facilities may result in negative impacts on existing vegetation. 	<ul style="list-style-type: none"> Potential physical vegetation impacts as a result of road widening/upgrading required to accommodate improved transit services. Roadway widening may require improved stormwater management facilities to treat drainage. Stormwater facilities may result in negative impacts to existing vegetation. 	<ul style="list-style-type: none"> Very limited, if any, physical vegetation impacts would result from implementing TSM improvements. Increased traffic demands on roadways in the local area will be realized. This may require improved stormwater management facilities to treat roadway runoff; stormwater facilities may result in negative impacts on existing vegetation. 	<ul style="list-style-type: none"> Potential physical vegetation impacts as a result of road widening/upgrading. Provision of additional capacity on other arterials would encourage motorists in the short term not to use local routes through the Rouge Park; in particular, this will have a positive effect on vegetation in the area. 	<ul style="list-style-type: none"> No physical impacts. Increased traffic demands on roadways in the local area will be realized. This may require improved stormwater management facilities to treat roadway runoff; stormwater facilities may result in negative impacts on existing vegetation. 	<ul style="list-style-type: none"> No physical impacts. Increased traffic demands on roadways in the local area will be realized. This may require improved stormwater management facilities to treat roadway runoff; stormwater facilities may result in negative impacts on existing vegetation. 	<ul style="list-style-type: none"> Physical vegetation impacts as a result of the highway extension. Provision of additional capacity from the new highway would encourage motorists in the short term, not to use local routes including those through the Rouge Park south of Steeles Avenue. This will have a positive effect on vegetation in the area.
Wildlife Habitat	<ul style="list-style-type: none"> No physical impact to wildlife habitat. 	<ul style="list-style-type: none"> Potential for minor impact to wildlife habitat to road widening/upgrading. 	<ul style="list-style-type: none"> No physical impact to wildlife habitat anticipated with implementing TSM measures. 	<ul style="list-style-type: none"> Potential for minor impact to wildlife habitat to road widening/upgrading. 	<ul style="list-style-type: none"> Potential for impact to wildlife habitat with the upgrading of arterials. 	<ul style="list-style-type: none"> No physical impact to wildlife habitat anticipated. 	<ul style="list-style-type: none"> Potential for impact to wildlife habitat to accommodate highway extension.
Fisheries	<ul style="list-style-type: none"> No fisheries impacts. Similar comment regarding roadway drainage as noted under the Vegetation sub factor. 	<ul style="list-style-type: none"> Potential for fisheries impacts as a result of road widening/upgrading. Similar comment regarding roadway drainage as noted under the Vegetation sub factor. 	<ul style="list-style-type: none"> No fisheries impacts. Similar comment regarding roadway drainage as noted under the Vegetation sub factor. 	<ul style="list-style-type: none"> Potential for fisheries impacts as a result of road widening/upgrading. Similar comment regarding roadway drainage as noted under the Vegetation sub factor. 	<ul style="list-style-type: none"> Potential for fisheries impacts as a result of upgrading of arterials. Similar comment regarding roadway drainage as noted under the Vegetation sub factor. 	<ul style="list-style-type: none"> No fisheries impacts. Similar comment regarding roadway drainage as noted under the Vegetation sub factor. 	<ul style="list-style-type: none"> Potential for fisheries impacts as a result of highway extension. Similar comment regarding roadway drainage as noted under the Vegetation sub factor.
Surface and Groundwater	<ul style="list-style-type: none"> Increased traffic demands on roadways in the local area has the potential to affect surface and groundwater quality through increases in pollution loadings. 	<ul style="list-style-type: none"> Increased traffic demands and added lanes has the potential to affect surface and groundwater quantity and quality by increasing runoff quantities. 	<ul style="list-style-type: none"> Increased traffic demands on roadways in the local area has the potential to affect surface and groundwater quality through increases in pollution loadings. 	<ul style="list-style-type: none"> Increased traffic demands on roadways in the local area has the potential to affect surface and groundwater quality through increases in pollution loadings. 	<ul style="list-style-type: none"> Increased traffic demands and added lanes has the potential to affect surface and groundwater quantity and quality by increasing runoff quantities. 	<ul style="list-style-type: none"> Increased traffic demands on roadways in the local area has the potential to affect surface and groundwater quantity and quality through increases in pollution loadings. 	<ul style="list-style-type: none"> Increased traffic demands and added lanes has the potential to affect surface and groundwater quantity and quality by increasing runoff quantities.

TABLE 3.2.2
ASSESSMENT OF TRANSPORTATION SYSTEM PLANNING ALTERNATIVES

CRITERIA	DO NOTHING	IMPROVE TRANSIT SERVICES (Interregional, Regional, Intermunicipal, GO and Rail Transit)	IMPLEMENT TRANSPORTATION SYSTEM MANAGEMENT MEASURES (TSM)	PROMOTE TRANSPORTATION DEMAND MANAGEMENT IMPROVEMENTS (TDM)	UPGRADE ARTERIAL/MUNICIPAL ROADWAYS	ENCOURAGE COMMUNITY GROWTH MANAGEMENT	EXTEND HIGHWAY 407 EASTERLY (With protection for transitway facilities)
SOCIAL ENVIRONMENT							
Property Impacts	<ul style="list-style-type: none"> No physical property impacts. 	<ul style="list-style-type: none"> Potential for minor physical property acquisition associated with roadway widening to accommodate improved transit service. 	<ul style="list-style-type: none"> Potential for minor physical property acquisition associated with local TSM improvements. 	<ul style="list-style-type: none"> Potential for minor physical property acquisition associated with separate HOV lanes. 	<ul style="list-style-type: none"> Potential for major physical property acquisition as a result of widenings or realignments. 	<ul style="list-style-type: none"> No physical property impacts. 	<ul style="list-style-type: none"> Facility on the "technically preferred route" will require a significant amount of property relative to the other planning alternatives; however, a majority of the required lands are currently in Provincial ownership. Impacts to tenants in existing properties.
Community Impacts <ul style="list-style-type: none"> traffic infiltration 	<ul style="list-style-type: none"> Increased traffic volumes through Whitevale, Box Grove, Green River, Brougham, South Pickering and Locust Hill. This represents a negative impact as existing volumes are considered to be excessive by local residents. As east-west traffic demands increase, there will be an increase in potential traffic infiltration through existing and future residential areas/communities as well as on roads through the Rouge Valley. 	<ul style="list-style-type: none"> Even with transit improvements, traffic volumes will continue to increase through Whitevale, Box Grove, Green River, Brougham, South Pickering and Locust Hill. This represents a negative impact as existing volumes are considered to be excessive by local residents. As east-west traffic demands increase, there will be an increase in potential traffic infiltration through existing and future residential areas/communities as well as on roads through the Rouge Valley. 	<ul style="list-style-type: none"> TSM improvements will not result in reductions to traffic volumes through Whitevale, Box Grove, Green River, Brougham, South Pickering and Locust Hill. This represents a negative impact as existing volumes are considered to be excessive by local residents. As east-west traffic demands increase, there will be an increase in potential traffic infiltration through existing and future residential areas/communities as well as on roads through the Rouge Valley. 	<ul style="list-style-type: none"> TDM improvements will not result in reductions to traffic volumes through Whitevale, Box Grove, Green River, Brougham, South Pickering and Locust Hill. This represents a negative impact as existing volumes are considered to be excessive by local residents. As east-west traffic demands increase, there will be an increase in potential traffic infiltration through existing and future residential areas/communities as well as on roads through the Rouge Valley. 	<ul style="list-style-type: none"> Widening/upgrading of arterial/municipal roadways may result in reductions to traffic volumes in Whitevale, Box Grove, Green River, Brougham, South Pickering and Locust Hill. This represents a negative impact as existing volumes are considered to be excessive by local residents. As east-west traffic demands increase, there will be an increase in potential traffic infiltration through existing and future residential areas/communities as well as on roads through the Rouge Valley. 	<ul style="list-style-type: none"> Growth management will not result in reductions to traffic volumes in Whitevale, Box Grove, Green River, Brougham, South Pickering and Locust Hill. This represents a negative impact as existing volumes are considered to be excessive by local residents. As east-west traffic demands increase, there will be an increase in potential traffic infiltration through existing and future residential areas/communities as well as on roads through the Rouge Valley. 	<ul style="list-style-type: none"> Significant short term relief to community traffic problems in Whitevale, Box Grove, Green River, Brougham, South Pickering and Locust Hill in comparison with other planning alternatives. Future widening and extension of Highway 407 and implementation of a transitway will ensure that communities are more "protected" from future traffic impacts. Additional east-west freeway capacity will minimize traffic infiltration in existing and future residential areas/communities as well as on roads through the Rouge Valley in both the short and long term.
Agricultural Impacts	<ul style="list-style-type: none"> No physical impact. 	<ul style="list-style-type: none"> No physical impact. 	<ul style="list-style-type: none"> No physical impact. 	<ul style="list-style-type: none"> Potential impact on Class 1 and Class 2 agricultural lands associated with widening to accommodate HOV facilities. 	<ul style="list-style-type: none"> Potential impact on Class 1 and Class 2 agricultural lands associated with roadway widening. 	<ul style="list-style-type: none"> No physical impact. 	<ul style="list-style-type: none"> Removal of Class 1 and Class 2 agricultural lands although these lands have been identified in local Official Plans for development.
Noise Impacts	<ul style="list-style-type: none"> Noise levels will continue to increase as a result of additional volumes on existing area roadways. Noise levels not generally mitigated on arterial/ collector/ local roads. 	<ul style="list-style-type: none"> Noise levels will continue to increase as a result of additional volumes on existing area roadways. Noise levels not generally mitigated on arterial/ collector/ local roads. 	<ul style="list-style-type: none"> Noise levels will continue to increase as a result of additional volumes on existing area roadways. Noise levels not generally mitigated on arterial/ collector/ local roads. 	<ul style="list-style-type: none"> Noise levels will continue to increase as a result of additional volumes on existing area roadways. Noise levels not generally mitigated on arterial/ collector/ local roads. 	<ul style="list-style-type: none"> Noise levels will continue to increase as a result of additional volumes on existing area roadways. Noise levels not generally mitigated on arterial/ collector/ local roads. 	<ul style="list-style-type: none"> Noise levels will continue to increase as a result of additional volumes on existing area roadways. Noise levels not generally mitigated on arterial/ collector/ local roads. 	<ul style="list-style-type: none"> Noise levels will increase along the Highway 407 corridor; however, there exists a greater potential to mitigate noise generated on Highway 407 in comparison to other east-west arterial/ collector/ local roads.
Aesthetics	<ul style="list-style-type: none"> No change in aesthetics. 	<ul style="list-style-type: none"> Potential for changes in aesthetics (negative impacts) if existing roadways are widened to accommodate transit lanes. Impacts difficult to mitigate in existing urban areas. 	<ul style="list-style-type: none"> Potential for minor aesthetic changes at intersections. Impacts difficult to mitigate in existing urban areas. 	<ul style="list-style-type: none"> Potential for changes in aesthetics (negative impacts) if existing roadways are widened to accommodate HOV lanes. Impacts difficult to mitigate in existing urban areas. 	<ul style="list-style-type: none"> Potential for changes in aesthetics (negative impacts) associated with road widening/upgrading. Impacts difficult to mitigate in existing urban areas. 	<ul style="list-style-type: none"> No change in aesthetics. 	<ul style="list-style-type: none"> Significant change in aesthetics adjacent to highway extension. Impacts could be mitigated through sensitive design strategies.

TABLE 3.2.2
ASSESSMENT OF TRANSPORTATION SYSTEM PLANNING ALTERNATIVES

CRITERIA	DO NOTHING	IMPROVE TRANSIT SERVICES (Interregional, Regional, Intermunicipal, GO and Rail Transit)	IMPLEMENT TRANSPORTATION SYSTEM MANAGEMENT MEASURES (TSM)	PROMOTE TRANSPORTATION DEMAND MANAGEMENT IMPROVEMENTS (TDM)	UPGRADE ARTERIAL/MUNICIPAL ROADWAYS	ENCOURAGE COMMUNITY GROWTH MANAGEMENT	EXTEND HIGHWAY 407 EASTERLY (With protection for transitway facilities)
ECONOMIC ENVIRONMENT							
Re-development/development potential	<ul style="list-style-type: none">• Future re-development/ potential of residential/ industrial lands compromised due to lack of long term east-west capacity.• Future growth in Durham and York, such as the Seaton and Cornell communities and proposed Pickering Airport, are constrained as a result of insufficient capacity across the Metro-York/Durham boundary.• Potential for business/ industry to relocate outside the GTA due to the impacts of congestion.• The economy and development potential of the entire GTA is constrained by congestion on all roads in the eastern portion of the GTA.• Access to markets in Eastern Canada and parts of the U.S. is also adversely affected.• Accessibility to the area, i.e. east-west transportation constraints will effect growth in tourism.	<ul style="list-style-type: none">• Future re-development/ potential of residential/ industrial lands compromised due to lack of long term east-west capacity.• Future growth in Durham and York, such as the Seaton and Cornell communities and proposed Pickering Airport, are constrained as a result of insufficient capacity across the Metro-York/Durham boundary.• Potential for business/ industry to relocate outside the GTA due to the impacts of congestion.• The economy and development potential of the entire GTA is constrained by congestion on all roads in the eastern portion of the GTA.• Access to markets in Eastern Canada and parts of the U.S. is also adversely affected.• Accessibility to the area, i.e. east-west transportation constraints will effect growth in tourism.	<ul style="list-style-type: none">• Future re-development/ potential of residential/ industrial lands compromised due to lack of long term east-west capacity.• Future growth in Durham and York, such as the Seaton and Cornell communities and proposed Pickering Airport, are constrained as a result of insufficient capacity across the Metro-York/Durham boundary.• Potential for business/ industry to relocate outside the GTA due to the impacts of congestion.• The economy and development potential of the entire GTA is constrained by congestion on all roads in the eastern portion of the GTA.• Access to markets in Eastern Canada and parts of the U.S. is also adversely affected.• Accessibility to the area, i.e. east-west transportation constraints will effect growth in tourism.	<ul style="list-style-type: none">• Future re-development/ potential of residential/ industrial lands compromised due to lack of long term east-west capacity.• Future growth in Durham and York, such as the Seaton and Cornell communities and proposed Pickering Airport, are constrained as a result of insufficient capacity across the Metro-York/Durham boundary.• Potential for business/ industry to relocate outside the GTA due to the impacts of congestion.• The economy and development potential of the entire GTA is constrained by congestion on all roads in the eastern portion of the GTA.• Access to markets in Eastern Canada and parts of the U.S. is also adversely affected.• Accessibility to the area, i.e. east-west transportation constraints will effect growth in tourism.	<ul style="list-style-type: none">• Increase in capacity will provide short term enhancement in residential/ industrial development/ potential.• Future growth in Durham and York, such as the Seaton and Cornell communities and proposed Pickering Airport, are constrained as a result of insufficient capacity across the Metro/Durham boundary.• Potential for business/ industry to relocate outside the GTA due to the impacts of congestion.• The economy and development potential of the entire GTA is constrained by congestion on all roads in the eastern portion of the GTA.• Access to markets in Eastern Canada and parts of the U.S. is also adversely affected.• Some short term opportunities for tourism growth.	<ul style="list-style-type: none">• Future re-development/ potential of residential/ industrial lands compromised due to lack of long term east-west capacity.• Future growth in Durham and York, such as the Seaton and Cornell communities and proposed Pickering Airport, are constrained as a result of insufficient capacity across the Metro/Durham boundary.• Potential for business/ industry to relocate outside the GTA due to the impacts of congestion.• The economy and development potential of the entire GTA is constrained by congestion on all roads in the eastern portion of the GTA.• Access to markets in Eastern Canada and parts of the U.S. is also adversely affected.• Accessibility to the area, i.e. east-west transportation constraints will effect growth in tourism.	<ul style="list-style-type: none">• Increase in capacity and the provision of a highway facility north of the existing urban areas in Durham, will provide significant short and long term enhancement in re-development/development potential for residential and industrial lands.• Will support development of Seaton and Cornell lands.• Will support development of future Pickering Airport.• Will provide short term benefits for tourism sector and, with further expansion, will enhance long term growth opportunities.
Satisfy Official Plans Goals and Objectives, Policies	<ul style="list-style-type: none">• Consistent with the Province's policy that no new roads be constructed within the Rouge Park south of Steeles Avenue.• Future population and employment projections/goals in Durham and other areas in the GTA would not be attainable due to a constrained transportation system.	<ul style="list-style-type: none">• May not fully comply with the Province's policy that no new roads be constructed within the Rouge Park south of Steeles Avenue.• Future population and employment projections/goals in Durham and other areas in the GTA would not be attainable due to a constrained transportation system.• Consistent with transportation networks defined in previous long range transportation planning studies.	<ul style="list-style-type: none">• May not fully comply with the Province's policy that no new roads be constructed within the Rouge Park south of Steeles Avenue.• Future population and employment projections/goals in Durham and other areas in the GTA would not be attainable due to a constrained transportation system.	<ul style="list-style-type: none">• Not consistent with the Province's policy that no new roads be constructed within the Rouge Park south of Steeles Avenue.• Widening of roadways through the Rouge Park may be required to accommodate additional traffic and or transit/HOV lanes.• Although some growth can be accommodated, future population and employment projections/goals in Durham would not be attainable due to a constrained transportation system.• Some arterial road improvements are identified in previous long range transportation planning studies.	<ul style="list-style-type: none">• Consistent with the Province's policy that no new roads be constructed within the Rouge Park south of Steeles Avenue.• Future population and employment projections/goals in Durham and other areas in the GTA would not be attainable due to a constrained transportation system.• Further widening and extension to the east would assist in facilitating achievement of Official Plan growth levels in the Region of Durham.	<ul style="list-style-type: none">• Consistent with the Province's policy that no new roads be constructed within the Rouge Park south of Steeles Avenue provided that the facility is constructed on the technically preferred route.• A four lane interim extension would help to facilitate some population and employment growth in Durham.• Further widening and extension to the east would assist in facilitating achievement of Official Plan growth levels in the Region of Durham.	

TABLE 3.2.2
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CRITERIA	DO NOTHING	IMPROVE TRANSIT SERVICES (Interregional, Regional, Intermunicipal, GO and Rail Transit)	IMPLEMENT TRANSPORTATION SYSTEM MANAGEMENT MEASURES (TSM)	PROMOTE TRANSPORTATION DEMAND MANAGEMENT IMPROVEMENTS (TDM)	UPGRADE ARTERIAL/MUNICIPAL ROADWAYS	ENCOURAGE COMMUNITY GROWTH MANAGEMENT	EXTEND HIGHWAY 407 EASTERLY (With protection for transitway facilities)
Accessibility/Impact to Employment Areas	<ul style="list-style-type: none">As traffic demands increase, the ability to access employment areas in Durham, York and Metro will continue to deteriorate.Increased "business" costs resulting from increased employee and commercial vehicle travel times.Loss of employment opportunities in Durham due to cross boundary transportation constraints.	<ul style="list-style-type: none">This alternative will not permit the transportation network to accommodate future traffic demands.As congestion increases, the ability to access employment areas in Durham, York and Metro will continue to deteriorate.Additional "business" costs resulting from increased employee and commercial vehicle travel times.Loss of employment opportunities in Durham due to cross boundary transportation constraints.	<ul style="list-style-type: none">This alternative will not permit the transportation network to accommodate future traffic demands.As congestion increases, the ability to access employment areas in Durham, York and Metro will continue to deteriorate.Additional "business" costs resulting from increased employee and commercial vehicle travel times.Loss of employment opportunities in Durham due to cross boundary transportation constraints.	<ul style="list-style-type: none">This alternative will not permit the transportation network to accommodate future traffic demands.As congestion increases, the ability to access employment areas in Durham, York and Metro will continue to deteriorate.Additional "business" costs resulting from increased employee and commercial vehicle travel times.Loss of employment opportunities in Durham due to cross boundary transportation constraints.	<ul style="list-style-type: none">The provision of additional capacity on existing arterials, may offer some improvement, in the short term, in the ability to access employment areas in Durham, York and Metro.In the longer term, congestion will affect the ability of motorists to access employment areas in Durham and York.Additional "business" costs resulting from increased employee and commercial vehicle travel times.Loss of employment opportunities in Durham due to future cross boundary transportation constraints.	<ul style="list-style-type: none">This alternative will not permit the transportation network to accommodate future traffic demands.As congestion increases, the ability to access employment areas in Durham, York and Metro.Increased business costs resulting from increased employee and commercial vehicle travel times.Loss of employment opportunities in Durham due to cross boundary transportation constraints.	<ul style="list-style-type: none">Provision of short term east-west capacity will enhance accessibility to existing and new employment areas in Durham, York and Metro.Short term reduction in existing business costs resulting from a decrease in overall employee and commercial vehicle travel times.Will support improvement in short term employment opportunities in Durham as well as the rest of the GTA resulting from the improved cross boundary access.
CULTURAL ENVIRONMENT							
Built Heritage Structures	<ul style="list-style-type: none">No impact.	<ul style="list-style-type: none">Potential impact to built heritage structures if impacted by required roadway widenings.	<ul style="list-style-type: none">No impact.	<ul style="list-style-type: none">Potential impact to built heritage structures if impacted by required roadway widenings.	<ul style="list-style-type: none">Potential impact to built heritage structures if impacted by required roadway widenings.	<ul style="list-style-type: none">No impact.	<ul style="list-style-type: none">Potential impact built heritage structures if impacted by proposed route.
Archaeological Resources	<ul style="list-style-type: none">No impact.	<ul style="list-style-type: none">Potential impact to archaeological sites if impacted by required roadway widenings.	<ul style="list-style-type: none">No impact.	<ul style="list-style-type: none">Potential impact to archaeological sites if impacted by required roadway widenings.	<ul style="list-style-type: none">Potential impact to archaeological sites if impacted by required roadway widenings.	<ul style="list-style-type: none">No impact.	<ul style="list-style-type: none">Potential impact to archaeological sites if impacted by proposed route.
ENGINEERING							
Impact on capacity during construction, i.e. staging	<ul style="list-style-type: none">No impact.	<ul style="list-style-type: none">Potential for minor impacts to roadway and intersection capacity during construction.	<ul style="list-style-type: none">Potential for minor impacts to intersection capacity during construction.	<ul style="list-style-type: none">Potential for significant impact to roadway and transit capacity during construction.	<ul style="list-style-type: none">Potential for significant impact to roadway and transit capacity during construction.	<ul style="list-style-type: none">No impact.	<ul style="list-style-type: none">No impact.
Utility Conflicts	<ul style="list-style-type: none">No impact.	<ul style="list-style-type: none">Potential for minor utility conflicts associated with construction.	<ul style="list-style-type: none">Potential for minor utility conflicts associated with construction.	<ul style="list-style-type: none">Potential for major utility conflicts associated with construction.	<ul style="list-style-type: none">Potential for major utility conflicts associated with construction.	<ul style="list-style-type: none">No impact.	<ul style="list-style-type: none">Potential for major utility conflicts associated with construction.

ASSESSMENT OF TRANSPORTATION SYSTEM PLANNING ALTERNATIVES						
CRITERIA	DO NOTHING	IMPROVE TRANSIT SERVICES (Interregional, Regional, Intermunicipal, GO and Rail Transit)	IMPLEMENT TRANSPORTATION SYSTEM MANAGEMENT MEASURES (TSM)	PROMOTE TRANSPORTATION DEMAND MANAGEMENT IMPROVEMENTS (TDM)	UPGRADE ARTERIAL/MUNICIPAL ROADWAYS	ENCOURAGE COMMUNITY GROWTH MANAGEMENT
SUMMARY OF ASSESSMENT AND RECOMMENDATIONS	<ul style="list-style-type: none"> Does not satisfy short and/or long term transportation requirements. Significant local economic and social negative impacts. Negative economic impacts within the entire GTA. Impacts growth potential in Durham and ability of Region to manage growth in the future. Does not permit the provision of higher order transit service in the future because appropriate infrastructure not provided. <p><i>Not recommended; do not carry forward.</i></p>	<ul style="list-style-type: none"> Does not satisfy short and/or long term transportation requirements. Significant local economic and social negative impacts. Negative economic impacts within the entire GTA. Impacts growth potential in Durham and ability of Region to manage growth in the future. Does not permit the provision of higher order transit service in the future because appropriate infrastructure not provided. The need to provide for additional transit service within and between municipalities and Regions is fundamental. <p><i>Not a solution to the defined short term problems; do not carry forward.</i></p>	<ul style="list-style-type: none"> Does not satisfy short and/or long term transportation requirements. Significant local economic and social negative impacts. Negative economic impacts within the entire GTA. Impacts growth potential in Durham and ability of Region to manage growth in the future. Does not permit the provision of higher order transit service in the future because appropriate infrastructure not provided. TSM improvements are required at certain capacity deficient intersections to maximize the existing road network capacity regardless of the preferred "planning" solution. <p><i>Not a solution to the defined short term problems; do not carry forward.</i></p>	<ul style="list-style-type: none"> Does not satisfy short and/or long term transportation requirements. Significant local economic and social negative impacts. Negative economic impacts within the entire GTA. Impacts growth potential in Durham and ability of Region to manage growth in the future. Does not permit the provision of higher order transit service in the future because appropriate infrastructure not provided. The need to encourage additional person capacity with fewer cars is desirable. <p><i>Not a solution to the defined short term problems; do not carry forward.</i></p>	<ul style="list-style-type: none"> Does not satisfy short and/or long term transportation requirements. Significant local economic and social negative impacts. Negative economic impacts within the entire GTA. Impacts growth potential in Durham and ability of Region to manage growth in the future. Does not permit the provision of higher order transit service in the future because appropriate infrastructure not provided. The need to upgrade and widen certain strategic roadways, where practical, to maximize the local and regional road network should be considered. <p><i>Not a solution to the defined short term problems; do not carry forward.</i></p>	<ul style="list-style-type: none"> Does not satisfy short and/or long term transportation requirements. Significant local economic and social negative impacts. Negative economic impacts within the entire GTA. Impacts growth potential in Durham and ability of Region to manage growth in the future. Does not permit the provision of higher order transit service in the future because appropriate infrastructure not provided. Given current growth and development trends within the Durham, this solution is not considered practical in terms of reducing short term traffic demands. The need to encourage growth management strategies within communities to minimize cross regional boundary trips should be pursued. <p><i>Not a solution to the defined short term problems; do not carry forward.</i></p>
						<p>EXTEND HIGHWAY 407 EASTERLY (With protection for transitway facilities)</p> <ul style="list-style-type: none"> Consistent with transportation networks defined in previous long range transportation planning studies. The easterly extension of Highway 407 as a 4 lane facility will provide significant relief to short term capacity constraints. With widening (up to 10 lanes) within the right-of-way, this roadway could significantly contribute to satisfying long term transportation demands. Protection of the appropriate right-of-way permits the provision of higher order transit service in the future. The transitway will permit the accommodation of future transit demands, which cannot be satisfied by other "planning" alternatives. The easterly extension of Highway 407 and the provision of transitway facilities clearly represent critical components in the future transportation networks for Durham and York. These improvements together provide the maximum relief to existing traffic and community problems within the Study Area and serve to enhance the ability of the transportation system to satisfy traffic demands through the Region of Durham and across the Metro-York/Durham boundary. <p><i>The only strategy that will satisfy existing transportation/ traffic and social issues. Carry forward for more detailed consideration.</i></p>

3.3 PLANNING ALTERNATIVES - SYNOPSIS

The following is noted when summarizing the ability of the planning alternatives to satisfy the transportation related objectives articulated in Section 2.1.1 of this document.

The "Do Nothing" Alternative:

- The "Do Nothing" alternative will not alleviate the existing travel demand deficiencies across the Metro-York/Durham boundary nor will it address traffic related problems that will arise as a result of the termination of Highway 407 at Markham Road. The "Do Nothing" alternative will not permit the area transportation network to address future travel demands whether they be accommodated on transit or on roads. This alternative would seriously impact the ability of the Regional Municipality of Durham to grow from both a population and employment perspective. This alternative will have a negative impact on recreational travel and goods movement. Although this alternative has no direct physical impacts on vegetation, wildlife, watercourses, and heritage resources, there will be adverse local air quality effects within communities as traffic and congestion increase. The social impacts with this alternative relates to the effects of increasing traffic volumes in communities producing noise, dust and mobility problems. *The "Do Nothing" alternative is not a practical solution to the problems being addressed in the context of this Study.*

Improve Transit Service (New Interregional, Regional, Intermunicipal, GO and Rail Transit):

- This alternative has the potential to adversely affect vegetation, wildlife, watercourses, and heritage resources to the extent that right-of-way expansions and new station locations are required. However, the effects would generally be in areas where similar impacts have already occurred. To the extent that greater use of transit can be achieved, some air quality improvements can be expected. However, this alternative is not likely to reduce the trend of increased congestion in the local communities, resulting in increased deterioration of local air quality. Since with this alternative, roadway traffic demands will still increase, there will be similar social and economic impacts as described in the Do Nothing Alternative. Despite optimistic assumptions employed in the transportation analysis regarding future transit demand within Durham and York and across the Metro-York/Durham boundary, the reality is that transit system improvements will provide limited benefit in the short term and will not on their own represent a practical solution to the problems being addressed by this Environmental Assessment. *When reviewing the potential opportunities for transit improvements, however significant, these improvements, will not by themselves satisfy existing or future travel demands across the Metro-York/Durham boundary.* The following significant factors must be acknowledged when considering the ability of mass transit on its own to handle future mobility requirements and reduce traffic demands:

- Funding cuts to local transit systems likely precludes any system expansion in the short term. Service cuts are a more likely scenario;
- Transit systems are traditionally in a "catch-22" situation when it comes to expanding services. For example, under current funding and subsidy levels, service expansion requires more revenue to be obtained through the fare-box and revenue can only come from increased ridership; increased ridership can only occur with service expansion whether it is increased frequency on existing routes or the development of new routes;
- Current development patterns within the GTA and the subsequent travel patterns of Region of Durham residents, i.e., trips from many origins to many destinations currently precludes the provision of cost-effective service which would be accepted by Durham residents;
- Public attitudes toward transit and their perceptions regarding the convenience of this mode, particularly in suburban areas, also represents a significant challenge for transportation professionals trying to improve the image of transit and reduce the number of automobile trips generated by Durham residents;
- There are currently no substantive or programmed plans to expand GO Transit bus or transit rail services, or improve VIA heavy rail service to the point where it would begin to address future mobility requirements of the community; and
- Increased development and use of transit services will be a key to addressing future mobility demands and must form part of a balanced transportation plan for the Region of Durham and for travel across the Metro-York/Durham boundary.

Implement Transportation System Management (TSM) Measures:

- Minor localized improvements on roadways within the Study Area could be affected with the implementation of Transportation Systems Management (TSM) measures. This alternative will have limited direct physical impacts on vegetation, wildlife, watercourses, and heritage resources. ***However, minor intersection improvements and traffic signal optimization will not adequately address existing or future deficiencies in transportation system capacity.*** This alternative will provide little or no benefit to recreational travel or goods movement. There is likely to be increased traffic on existing roadways and within local communities; resulting in continued deterioration of local air quality. The social impacts with this alternative relate to the effects of increasing traffic volumes in communities producing noise, dust and mobility problems.

Promote and Implement Transportation Demand Management Improvements (TDM)

- Transportation Demand Management (TDM) strategies are generally considered as companion strategies to land use planning and TSM improvements by addressing mobility requirements in an environmentally friendly and socially acceptable manner. Currently TDM "activities" have little impact on cross boundary travel and it is not likely that they can be expected to significantly contribute to reduced auto use, particularly in the short term. Many TDM strategies would not be readily applicable to cross boundary trips originating from or destined to the Region of Durham because of the average length of trips, the current dispersion of trip destinations and the convenience factor associated with driving an automobile;
- Notwithstanding the limited potential in the short term for reducing cross boundary auto travel demands, there are a number of initiatives which, in the long term, may be effective. The Ministry of Transportation and GTA Regions are currently preparing a GTA HOV Network Strategy which is intended to provide a comprehensive HOV network aimed at increasing auto occupancy and using available road infrastructure more effectively through increasing its person-capacity. The timing of the implementation of this strategy has not yet been set;
- This alternative will have limited direct physical impacts on vegetation, wildlife, watercourses, and heritage resources. However, because of its anticipated limited effectiveness in reducing cross-boundary travel demand, there is likely to be increased traffic on existing roadways and within local communities; resulting in continued deterioration of local air quality. The social impacts with this alternative relate to the effects of increasing traffic volumes in communities producing noise, dust and mobility problems. It will also limit the growth opportunities in the York and Durham Regions due to poor transportation access.
- ***TDM measures do not represent a practical solution to the defined short term problems in the Markham Road and the deficiencies in transportation impacts across the Metro-York/Durham boundary.*** This alternative will provide little or no benefit to recreational travel or goods movement.

Upgrade Other Arterial Roadways:

- Upgrading other arterial roadways, particularly across the Metro-York/Durham boundary, was thoroughly considered in the context of the traffic analyses, and as a potential "planning" alternative. Previous transportation and planning studies including the Highway 407 Overview Study have reviewed the need for additional arterial roadway capacity across the Metro-York/Durham boundary and have suggested additional capacity could be obtained on the following existing or proposed arterial links:

- Bayly Street/Lawrence Avenue;
 - Highway 2;
 - Twyn Rivers Drive/Sheppard Avenue;
 - Rossland Road/Finch Avenue;
 - Taunton Road/Steeles Avenue;
 - 5th Concession/14th Avenue;
 - Highway 7;
 - Concession Road 7/Major Mackenzie Drive; and
 - Regional Road 5/Elgin Mills Roads.
- With respect to the potential for additional arterial capacity across the Metro-York/Durham boundary, the following is noteworthy:
- The Province of Ontario has previously committed to "no new roads" in the Rouge Valley south of Steeles Avenue, which immediately limits the east-west opportunities for improved transportation facilities between Steeles Avenue and Lake Ontario;
 - The Region of Durham and the Town of Pickering have agreed that the Bayly Street/Lawrence Avenue and Rossland Road/Finch Avenue connections, previously shown in the Region of Durham Official Plan (O.P.), will not be pursued and will ultimately be removed from Durham's O.P.;
 - The Stott's and Maxwell's Bridges (Twyn Rivers Drive) Class Environmental Assessment recently completed by the City of Scarborough, in conjunction with the Town of Pickering and Metropolitan Toronto, has concluded that the Sheppard Avenue/Twyn Rivers Drive connection should be considered a local link. A single lane bridge crossing the Rouge River will be maintained on this link;
 - Given the constraints on Kingston Road (formerly Highway 2) across the Rouge Valley, there is limited opportunity to upgrade Kingston Road to provide additional arterial capacity;
 - Both Taunton Road and Steeles Avenue have the potential to provide 3 lanes of arterial capacity (one-way) in the future. However, the planned widening of Steeles Avenue from 2 lanes (two-way) to 4 lanes (two-way) has been deferred indefinitely by the Municipality of Metropolitan Toronto;
 - Highway 7 is currently the major east-west provincial facility through the north of Durham Region. Widening of Highway 7 would result in major community and environmental impacts, particularly in the communities of Locust Hill, Green River, and Brougham. Through these communities, the Highway 7 corridor is not wide enough to provide for any widening. In addition, Highway 7 is a rural highway with many access points which reduce its effective capacity and, even if widened, would not provide sufficient capacity to accommodate deficiencies in the corridor;

- The Durham Region Official Plan designates the 5th Concession to 14th Avenue as a Type B Arterial road. There is no continuous connection today and the connection can only be made today by using Durham-York Road 30. This connection will likely be required as the Seaton community develops within the Region of Durham. Improvements to this connection could result in significant negative impact to homes in Box Grove (Markham) unless its implementation is "tied" to the extension of the Markham By-pass south of Highway 407. The community of Whitevale could essentially be "bypassed" as a result of this potential improvement. The ability to upgrade this link has yet to be formally confirmed through an Environmental Assessment; and
- Both the Concession Road 7/Major Mackenzie Drive and Regional Road 5/Elgin Mills Road connections are located north of Highway 7 and outside the main "corridor" of traffic demand. Upgrading these roadways to eliminate existing "jogs" is not likely to provide significant relief to roadways south of Highway 7.
- This alternative has the potential for causing adverse effects on vegetation, wildlife, watercourses and heritage resources to the extent that new or expanded roadways are constructed. In the short-term, improved air quality in communities may be achieved as traffic volumes and congestion are reduced. However, in the longer-term local road improvements will be insufficient to address the increased demand; and traffic volumes will increase, resulting in increased emissions and noise. The increased capacity will provide short-term development potential and tourism; however, the additional capacity will be insufficient to support proposed development plans over the long-term.
- In summary, *there is limited opportunity in both the short and long terms to affect capacity improvements across the Metro-York/Durham boundary using existing or future arterial roads.* Upgrading arterial roads will provide little or no benefit to recreational travel or goods movement.

Growth Management (Increased Self Containment in the Region of Durham):

- The management of both population and employment growth in the Region of Durham has the potential in the longer term (+20 years) to have an impact on travel demand and cross boundary travel. *In the short term and medium time-frames (up to 20 years), there will be limited opportunities to effect significant changes in travel patterns through growth management.* In this regard, the employment to population ratio in the Region, one indice which can reflect the level of self containment, has been *decreasing* over the last five to ten years. This essentially means that Durham's propensity to act as a "bedroom" community is currently changing for the worse when it comes to reducing cross boundary travel;

- This alternative will have limited direct physical impacts on vegetation, wildlife, watercourses, and heritage resources. However, there is likely to be increased traffic on existing roadways and within local communities; resulting in continued deterioration of local air quality. The social impacts with this alternative relate to the effects of increasing traffic volumes in communities producing noise, dust and mobility problems. It will also limit the growth opportunities in the York and Durham Regions due to poor transportation access; and
- The ability to use growth management as a strategy to reduce cross boundary travel is also affected by the desire of municipal governments to create plans which promote or encourage self containment, but which may be somewhat contrary to market forces or public desires/sentiment. For example, surveys conducted for the Region of Durham by the Angus Reid Group¹² have shown that people live in Durham and particularly Pickering and Ajax because of low house prices, the potential to own a single family dwelling unit and lower density communities. Encouraging municipalities to develop growth management policies which may be contrary to public or market demands may be a daunting task. This alternative will also provide little or no benefit to recreational travel or goods movement.

Extend Highway 407 Easterly (with protection for transitway facilities):

- This alternative will have adverse effects on vegetation, wildlife, watercourses, and historical resources. There will also be some localized increase in traffic-related noise; however, the reduced traffic and congestion within local communities will result in improved local air quality.
- The extension of Highway 407 easterly will provide significant relief to short term capacity constraints and will resolve community traffic problems in the area of Markham Road. *This is the only planning alternative that will adequately satisfy existing transportation/traffic and social (community) issues;* and
- This facility is also consistent with transportation networks depicted in previous long range transportation studies. The transportation/traffic analysis conducted within the context of this Study revealed that a right-of-way is required for this facility which will ultimately permit expansion to ten lanes (two way) and the provision of a parallel "higher order" transit facility.
- It should be noted that the Highway 407 and associated transitway facility represent complementary improvements and that one or the other, by themselves, will not satisfy future travel demand.

¹² Angus Reid Group Inc., Durham Transportation System Review - Public Opinion Research, 1994

3.4 SELECTION OF THE PREFERRED PLANNING ALTERNATIVE

Based on the results of the synopsis provided in **Section 3.3**, *extending Highway 407 (4 travel lanes) east of Markham Road was selected as the preferred planning alternative* to resolve existing short term capacity deficiencies across the Metro-York/Durham boundary and traffic problems within communities located in the Highway 7 corridor ("the problem"). The other planning alternatives considered within the assessment cannot, on their own, provide sufficient relief to cross boundary travel requirements in the short term.

Below are some of the "key" reasons for the recommended planning alternative:

- In the short term, the easterly extension of Highway 407 provides the maximum relief to existing community problems and east-west capacity constraints across the Metro-York/Durham boundary without the extension of this highway beyond Markham Road, and the future construction of a higher order transit facility adjacent to the roadway, existing communities will be seriously impacted by increased traffic volumes;
- The easterly extension of Highway 407 represents a critical component in the future transportation networks for the Regions of Durham and York as previously identified in the Highway 407 Overview Study and the Regional Official Plans;
- The easterly extension of Highway 407 will provide the opportunity to protect an appropriate right-of-way that allows for higher order transit service in the future; and
- Improved transit services, TSM and TDM measures, upgrading of existing arterials and municipal roadways and community growth management within Durham, will not solve short term transportation problems.

Even though the easterly extension of Highway 407 as a 4 lane facility will provide significant east-west capacity across the Metro-York/Durham boundary, it will not be able to satisfy all cross boundary traffic demands in year 2011 and beyond. ***Furthermore, the traffic analyses carried out for this Study have identified long term capacity deficiencies even with the provision of ten lanes on the easterly extension of Highway 407.*** In recognition of the findings of the assessment of planning alternatives and the traffic analysis associated with this study, the following is recommended:

- Protection for long term transportation demands through the Transportation Study Area including a ten lane Highway 407 and higher order transitway facility, with the understanding that other transit, road, TDM and growth management initiatives may all be required as part of a balanced transportation plan to satisfy mobility requirements across the Metro-York/Durham boundary;
- Ultimate widening of the easterly extension of Highway 407 which will significantly contribute to satisfying long term transportation demands;

- A balanced long range transportation plan consisting of a "blend" of the easterly extension of Highway 407 in association with the other planning alternatives is required which will maximize east-west cross boundary capacity and which will be consistent with the transportation networks defined in previous long range transportation planning studies; and
- The implementation of a balanced long range transportation plan that will assist in satisfying local, regional and inter-regional transit objectives.

The extension of Highway 407 as an "interim" 4-lane facility is a logical first priority in the package of improvements ultimately required to satisfy future mobility demands across the Metro-York/Durham boundary. This improvement, compared to the other planning alternatives, is the only one that satisfies both short and longer term mobility requirements, and it will maximize the transportation service provided by the Highway 407 Central.

Further expansion of the facility should be protected at this time in recognition of the future anticipated travel demands reflected in the analysis undertaken within the context of this study. Consistent with the findings of previous long range planning studies, a right-of-way should be protected for a basic 10-lane freeway facility.

Also, in recognition of the future transit demands, as articulated in Section 2.3.4, there is a defined need to protect for a higher order transit facility or transitway which will parallel Highway 407.

Both the future basic 10-lane freeway and the transitway will form part of a balanced transportation plan for Durham, York and Metro, and will serve to partially address future travel demand requirements in the Highway 7/407 corridor.

CHAPTER 4

EXISTING CONDITIONS

4.0 EXISTING CONDITIONS

4.1 INTRODUCTION

This chapter provides an overview description of existing baseline conditions in the study area. These baseline conditions formed the basis for the generation and assessment of the route alternatives and the selection of the recommended route. The information presented in this Chapter was gathered as part of the Route Planning Study, as part of follow-up biological inventories carried out on the technically preferred route to facilitate future design and through updating during the Feasibility Study. **Although the Route Planning Study addressed the entire Highway 407 corridor between Markham Road and Highway 35/115, only the information that is relevant to the study area between Markham Road and Highway 7 east of Brock Road has been included in this report.** The description is organized on the basis of the established factor groups and factors employed in the assessment of potential condition changes and effects associated with project implementation. A full list of factors considered in the assessment, along with their definitions is provided in Appendix 1.

The detailed environmental information was used for the following purposes:

- to identify constraints to guide the establishment of route alternatives (see Chapter 5);
- to assess and evaluate the impacts of the alternatives for the purposes of a comparative analysis (see Chapter 5); and
- to guide the design phase and the development of mitigating measures (see Chapter 6).

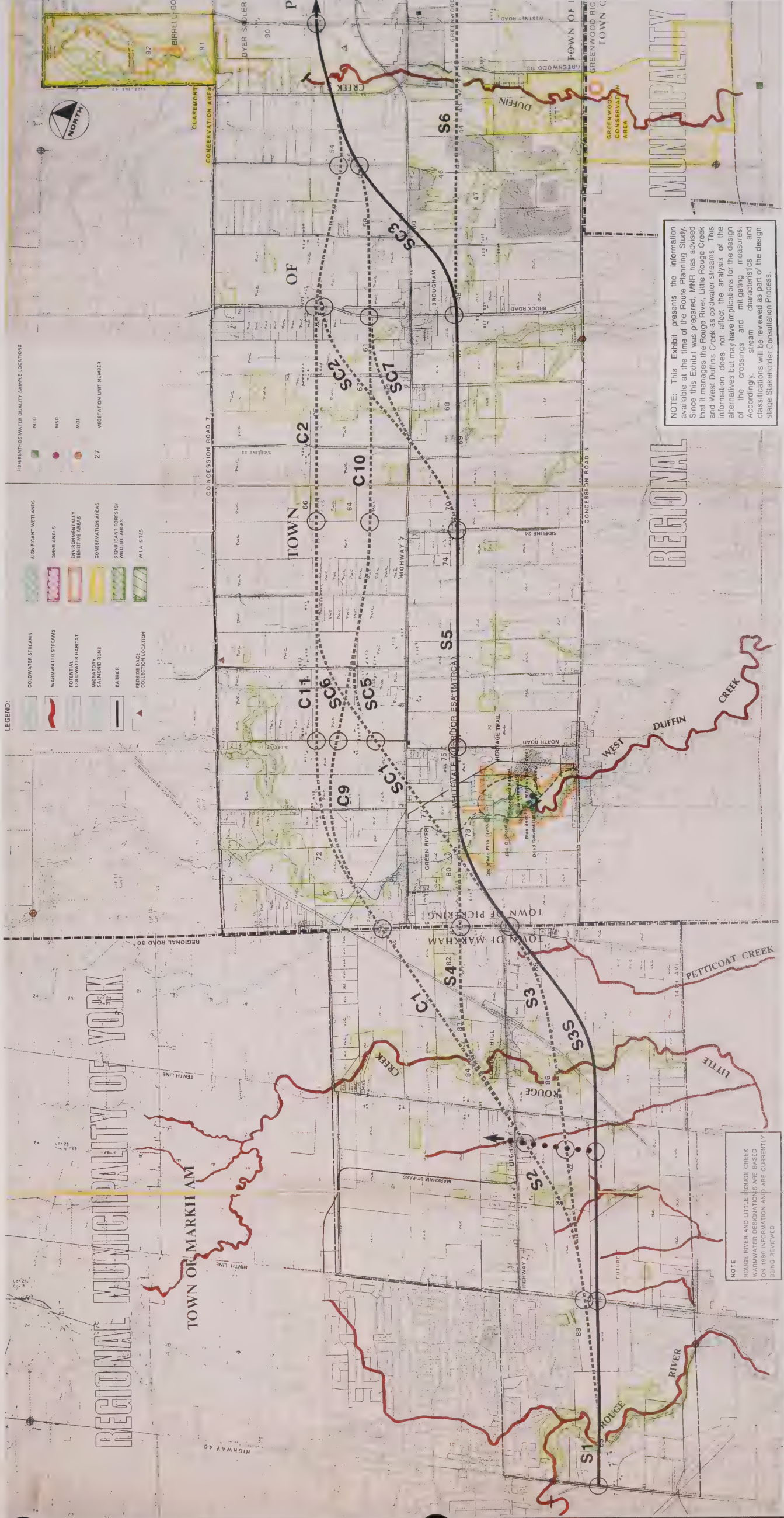
4.2 NATURAL ENVIRONMENT

An examination of natural environmental characteristics of the study area was undertaken. The information pertaining to these factors is described in the following sub-sections and illustrated in Exhibit 4.2.1. A separate exhibit (Exhibit 4.2.4) has been prepared for fisheries information (see Section 4.2.4).

The natural environmental characteristics were determined through:

- the compilation and review of **available published and unpublished information** obtained from government agencies, and interest groups;
- **consultation** with appropriate government agencies, landowners and other interested parties;
- **field investigations** conducted throughout the study area; and
- **assessment of potential loss or disruption** of natural features or systems associated with proposed route alternatives.

The environmental features for the study area (Markham Road to Highway 7 east of Brock Road) are presented in the following sections.



NOTE: This Exhibit presents the information available at the time of the Route Planning Study. Since this Exhibit was prepared, MNR has advised that it manages the Rouge River, Little Rouge Creek and West Duffins Creek as coldwater streams. This information does not affect the analysis of the design alternatives but may have implications for the design of the crossings and mitigating measures. Accordingly, stream characteristics and classifications will be reviewed as part of the design stage Stakeholder Consultation Process.

NOTE
ROUGE RIVER AND LITTLE ROUGE CREEK
WARMWATER DESIGNATIONS ARE BASED
ON 1988 INFORMATION AND ARE CURRENTLY
BEING REVIEWED

4.2.1 Surface Water Quality and Quantity

The study area is drained by the Rouge River, the Petticoat Creek and the Duffins Creek Watersheds. The boundaries of these watersheds and the study are shown on Exhibit 4.2.2.

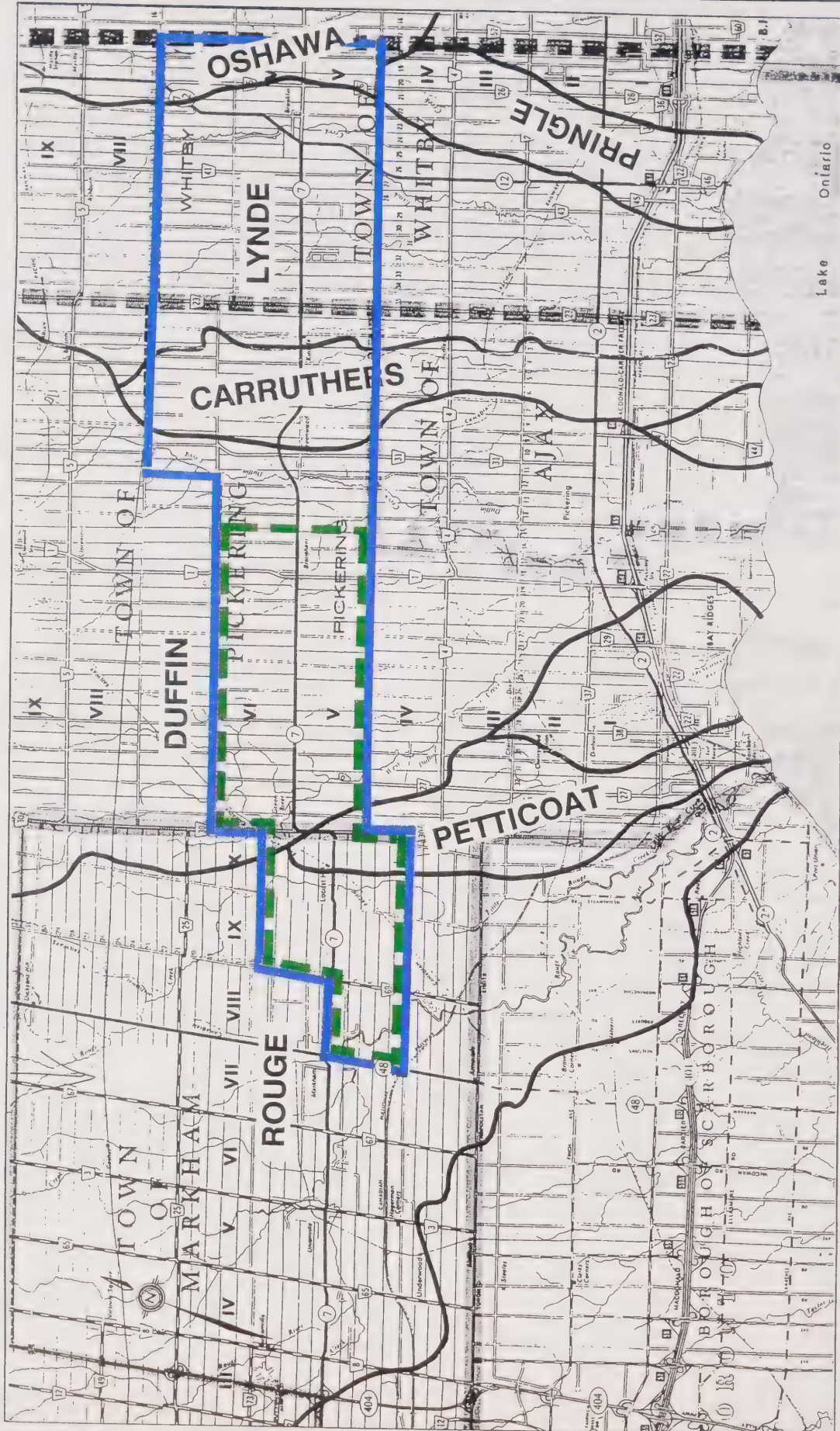
The headwaters of most of the watercourses affected by this study originate on the Oak Ridges Moraine, located north of the study area. The Oak Ridges Moraine has been recognized as a significant groundwater recharge area contributing to the maintenance of groundwater and surface water quality and quantity in the area. Overland flow within the study area is directed to the mid- and lower reaches of the principal watercourses of these watersheds via a network of swales, drains, ditches and intermittent channels. The Petticoat Creek is fed primarily by surface water runoff.

Headwater areas are predominantly in agricultural land uses. Development generally increases through the middle portions of these watersheds and includes scattered communities and rural estate residential properties. Throughout the lower reaches of the watersheds, extensive urbanization has occurred adjacent to Lake Ontario. Land use and development pressure throughout the study area have greatly influenced water quality characteristics of the principal watercourses.

The study area contains three principal rivers or branches, and an extensive network of tributaries. The Rouge River, Little Rouge Creek, and West Duffins Creek dominate the hydrologic setting of the study area. The general surface water quality of major watercourses within each watershed is described below. (See Appendix 2 for data).

Rouge River/Little Rouge Creek

The Rouge River watershed drains an area of 327 km² of primarily agricultural lands. Large urban centres, such as Markham and Scarborough, are found in the mid- and lower reaches of the watershed. Water quality in the Rouge River and Little Rouge Creek, the two principal watercourses of this watershed, is considered to be fair to good. Annual mean temperatures for these rivers range between 11°C -15°C with summer maxima reaching 25°C and higher. Oxygen resources are generally high with supersaturation occurring frequently. Turbidity and dissolved and suspended solids, as well as nutrient concentrations, are higher in the Rouge River than in Little Rouge Creek with concentrations strongly influenced by precipitation events in both watercourses. Total phosphorous concentrations in the Rouge River exceed the Provincial Water Quality Objective (PWQO) of the Ministry of Environment and Energy. Concentrations of nitrogen (NH₃, Nitrates, TKN) are also higher in the Rouge River. Bacteria concentrations (faecal coliform) in both watercourses are high and exceed the PWQO of 100 counts/100 ml.



HIGHWAY 407 / TRANSITWAY
MARKHAM ROAD EASTERLY TO
HIGHWAY 404

Route Planning Study Area
Study Area for Highway
15-1 Water Divide

APPROXIMATE LOCATION OF
STUDY AREA WATERSHEDS

Petticoat Creek

The headwaters of the Petticoat Creek watershed originates within the Highway 407 study area in a small area of Lots 9 and 10 in the 10th and 11th Concessions of the Town of Markham. The source of these warmwater headwaters is surface water runoff. There was no published water quality data available for Petticoat Creek. Since the Petticoat Creek does not have a major influence on the study area, this was not considered to be a concern.

Duffins Creek

The Duffins Creek watershed drains an area of 294 km² via West Duffins Creek and Duffins Creek, the two principal watercourses of the watershed. Land use in this watershed is primarily agriculture, pasture and forest. Urban areas within the watershed include the communities of Stouffville, Green River, Whitevale, Claremont, Brougham, Greenwood, Pickering and Ajax.

Water quality parameters in tributaries upstream of the MTO sampling site located in the study area (MTC 1976) indicated a higher quality of surface water. At these sites water temperatures were generally lower, as were turbidity and dissolved solids concentrations. Nutrient concentrations in upstream tributaries were high, presumably due to more extensive agricultural practices. Surface water quality in the Duffins Creek watershed, when compared to the Rouge River data, is good. Total phosphorous concentrations and faecal coliform counts, however, exceeded the PWQO at both the upstream and study area sampling sites. Headwaters of this watershed are known to rise on the Oak Ridges Moraine and, therefore, are not expected to exceed annual maxima of about 20° C.

Significance and Sensitivity

Good water quality and flow are essential to supporting aquatic habitat and systems. The maintenance of water quality (including temperature) and quantity in all of the watercourses affected by the undertaking should be a key consideration during the design of the highway. A stormwater management study should be conducted during the design phase in accordance with current guidelines to ensure commitment to the most appropriate Best Management Practices. Sediment and erosion control should be implemented as part of construction and maintenance activities.

4.2.2 Hydrogeology

The hydrogeology of the study area was examined to identify potential groundwater quality and supply interference problems, and potential problems posed to road construction due to high water table conditions. Information regarding water wells, aquifer locations and water quality were obtained from the MOEE, and the Regional Municipalities of York and Durham.

Recharge areas were identified from an Industrial Mineral Resources Sheet (Ontario Department of Mines, 1969) as well as from an Aggregate Resources Inventory Map (Ontario Geological

Survey 1981). Recharge areas were identified as those areas covered by a fairly thick ($>3\text{m}$) surficial layer of sands and gravels where rapid vertical infiltration can occur. Areas of high water table were transposed directly from the earlier 1976 "Highway 407 Route Planning Study" by MTO (See Exhibit 4.2.3).

Observations and field data obtained from the fisheries field survey carried out during the Route Planning Study, gave a preliminary indication of areas showing potential for groundwater upwelling, including bank seeps, swampy areas and open pools in generally frozen streams. These areas were compared to those shown on the hydrogeological mapping. Areas for further evaluation identified by these means were subject to subsequent hydrogeological field (excluding subsurface) investigations.

Overburden thickness varies considerably over the length of the study area, ranging from approximately 30 m near Greenwood to greater than 100 m near Locust Hill. The black shale of the Whitby Formation is the bedrock found at depth beneath the entire corridor length.

Although groundwater may be obtained from any depth in the overburden and in underlying bedrock, over 50% of the wells in the study area are relatively shallow ($<12\text{m}$ deep) bored or dug wells. Less than 5% of the wells in the study area tap bedrock for water since the yields are generally low ($<0.2\text{ l/s}$) and the water quality may be low due to the presence of sulphur or high salinity (Sibul *et al.* 1977).

Although adequate supplies of potable groundwater may be found anywhere in the overburden, there exist highly used permeable layers (i.e. aquifers) at various depths that are continuous over a fairly large area. The Brougham aquifer occurs at a general elevation of 183 m, underlies much of Lots 27 to 30 in Concession 6 in Pickering. The Markham aquifer, with an approximate elevation of 165 m, occurs in the northern part of Concession 9 in Markham in the study area. The Unionville aquifer occurs at an average elevation of 146 m and underlies the western half of Concession 7 in Markham. These aquifers, which make up the lower aquifer system in the study area, have yields that are generally less than 1.6 l/sec (Sibul *et al.* 1977).

The aquifers that make up the upper aquifer system are as follows. The (upper) Brougham aquifer occurs beneath part of Concession 6 in Pickering west of Brougham at an elevation of 195 m; a small portion of the Atha aquifer underlies part of Concession 6 west-northwest of Brougham; the (upper) Unionville aquifer underlies much of Concession 7 in Markham at an elevation of 168 m; the Cedar Grove aquifer underlies part of Concession 9 in Markham at an elevation of 140 m. Again yields tend to be lower than 1.6 l/sec, except for the Unionville aquifer which can have yields of up to 3.2 l/sec.

Water quality in the overburden is generally adequate for most potable uses, although excessive concentrations of iron, nitrate, total dissolved solids and total hardness have been noted (Sibul *et al.* 1977). Wells near or in the bedrock have produced water noted as being sulfurous or saline.

Groundwater recharge areas generally coincide with coarse textured soils present at the surface. Much of this sand and gravel occurs towards the southeast, outside of the study area, below the Lake Iroquois shoreline. However, recharge of the major aquifers below the study area will generally result from percolation of water from the confining layers directly above (Sibul *et al.* 1977).

Two areas within the corridor were identified through published information and field observation as having groundwater upwelling potential (refer to Exhibit 4.2.4). These areas included West Duffins Creek southeast of Green River and Urfé Creek west of Brougham. As well, in 1997, MNR reported groundwater/spring conditions in the vicinity of the unnamed tributary of the Duffins Creek east of Brougham.

Significance and Sensitivity

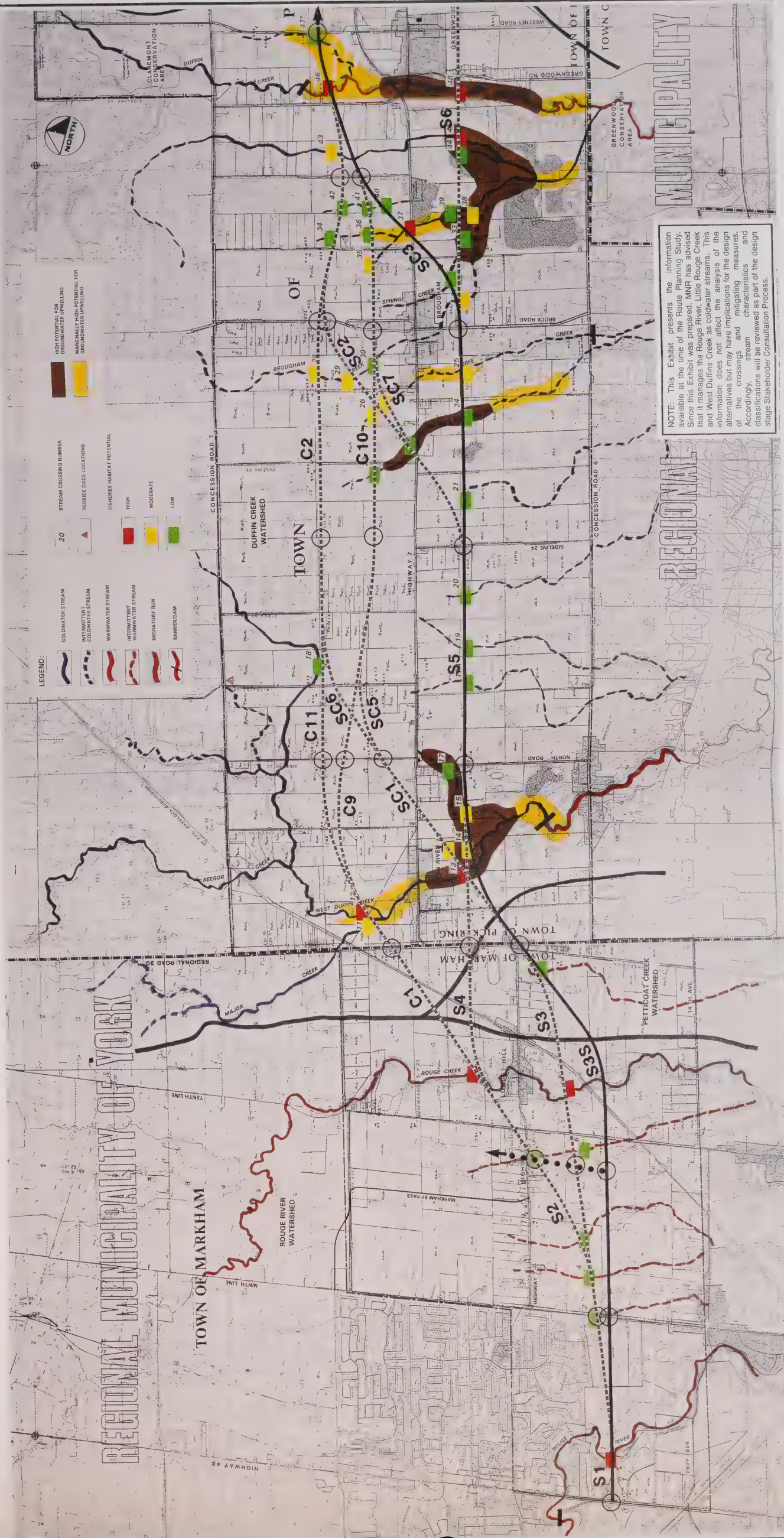
Due to their proximity to large, growing urban areas, many of the sand and gravel aggregates that act as recharge areas have been or are presently being extracted for building materials, and only encroachment into undisturbed areas will be of concern.

The large area of high water table in the study area, and the fact that about half of the wells are relatively shallow (<12 m) may make dewatering a significant issue. Dewatering of an excavation may reduce the supply quantities from a nearby well by reducing the available drawdown. The potential for contamination of these shallower wells by the infiltration of contaminated roadway runoff (containing roadsalt, oils, etc.) during the operation and maintenance of the highway/transitway is also an issue.

The major overburden aquifers described above are generally covered by a low permeability ($K = 10^{-5}$ cm/sec) layer of till. This confining layer should reduce the possibility of adversely affecting the quality of these aquifers during construction. An exception may be the lower Brougham aquifer which is overlain by fairly permeable ($K = 10^{-1}$ to 10^{-5} cm/sec) surficial sediments which would allow more rapid infiltration of contaminants contained in runoff from any new highway facility.

Encroachment into high potential upwelling areas could potentially degrade the quality and quantity of coldwater baseflow available to various streams, possibly impacting downstream biological resources. In addition, the installation of utilities can interfere with groundwater movement, potentially affecting shallow groundwater supplies.

Of the issues listed above, the most significant long term issues would be the potential effects on shallow well water quality and encroachment on potential groundwater upwelling areas. The potential for contamination of near-surface groundwater supplies would be the greatest in the vicinity of the Brougham aquifer. Encroachment on upwelling areas should be minimized through route selection, and special considerations should be given to maintaining upwelling areas during the design phase.



NOTE: This Exhibit presents the information available at the time of the Route Planning Study. Since this Exhibit was prepared, MNR has advised that it manages the Rouge River, Little Rouge Creek and West Duffins Creek as coldwater streams. This information does not affect the analysis of the alternatives but may have implications for the design of the crossings and mitigating measures. Accordingly, stream characteristics and classifications will be reviewed as part of the design stage Stakeholder Consultation Process.

When designing stormwater management facilities, consideration should be given to potential impacts to surface and groundwater resources. A stormwater management plan will be developed during the design phase.

4.2.3 Waste Management

According to the Abatement Section of the MOEE, Central Region office, and MOEE's Waste Disposal Site Inventory (June 1991), there are two reported inactive or unused waste sites in the vicinity of the study area. The first is site numbered 7094, apparently located on or near the former IBM golf course on Concession 8, Lot 6 in the Town of Markham. However, the MOEE has advised the Town of Markham that this site is likely located south of Fourteenth Avenue in the Rouge River valley and would therefore be outside the study area. The second waste disposal site is located on Part Lot 16, Concession 5 in the Town of Pickering. This site, referred to as the Brock North Landfill (MOEE Certificate of Approval Number A390405), accepted waste in the late 1970's. Although the whole site was certified for use as a landfill, only a portion of the site was actually used for waste disposal. The actual disposal area is located approximately 1 kilometre to the south of Highway 7. Early in 1997, the owner of this site began removing the waste to another site certified to receive the material.

Significance and Sensitivity

Waste disposal sites can significantly increase the difficulty and cost of constructing a transportation facility. The reuse of any waste disposal site will require the approval of the Minister of Environment and Energy under the Environmental Protection Act. Therefore, existing and abandoned waste disposal sites should be avoided when developing routing alternatives. In addition, lands contaminated through human activities can pose a significant liability for off-site impacts and cleanup costs. Where possible, these lands should be avoided. Where they cannot be avoided, contamination lands should be remediated to acceptable levels. Since most of the study area is within undeveloped lands, the likelihood of contamination is low. However, if significant contamination is discovered during subsequent phases, the sites will have to be managed in accordance with applicable legislation and site decommissioning guidelines.

4.2.4 Fisheries (Aquatic Biology)

The fisheries resources of the study area are diverse and widespread, with a variety of fish species inhabiting the watercourses in the study area.

Published and unpublished fisheries information for this study was obtained primarily from the former Maple and Lindsay District offices of the Ontario Ministries of Natural Resources, Government Services, Housing and Transportation, MTRC, and the Metropolitan Toronto Interim Landfill Site Search (Gartner Lee Limited 1988). District and regional MNR staff were consulted to obtain updated information on sensitive fishing areas and programs, policies and objectives within the two districts. As well, these agencies provided comments on completed reports and field studies. Regional MNR staff also supplied unpublished mapping of rare and endangered fish species of the study area.

Unpublished information was also supplied through comments, reports and mapping provided by public interest groups and obtained from the general public at information centres.

A general description of the fisheries of the main study area river systems follows. The location of evaluation sites used during route planning are presented in Exhibit 4.2.4. In preparation for the design phase, more detailed fisheries surveys, including electrofishing, were carried out in 1995 and during the spring and summer of 1996 in consultation with MNR. The purpose of these studies was to identify the presence of rare, endangered, threatened or vulnerable fish species and to document specific habitat conditions for the purposes of assessing site specific impacts and developing specific mitigating measures. The relevant information from the 1995 and 1996 studies is included in the following discussion. The results of the 1995 and 1996 fisheries assessments are provided in Appendix 19.

The major river systems within the study area provide habitat for resident and migratory warmwater and coldwater fish species. Besides the common species associated with rivers and streams, several rare and one vulnerable fish species are reported in the study area. A list of species inhabiting each of the major watercourses is included in Appendix 3 of this report.

Generally, the Rouge River, Little Rouge Creek and West Duffins Creek and their branches dominate the study area and are managed by MNR as coldwater streams. These watercourses support a significant local sport fishery primarily for resident coldwater species such as brook trout (*Salvelinus fontinalis*) and brown trout (*Salmo trutta*) and seasonal migratory runs of Lake Ontario salmonids including brown trout, rainbow trout (*Oncorhynchus mykiss*), coho salmon (*O. kisutch*) and chinook salmon (*O. tshawytscha*). The warmwater fishery includes quality sport fish such as largemouth bass (*Micropterus salmoides*) and smallmouth bass (*M. dolomieu*).

Petticoat Creek originates within the study area as an intermittent watercourse and therefore provides marginal warmwater fisheries habitat in its upper reaches (i.e. in the vicinity of the study area).

Rouge River Watershed

Rouge River

Within the study area the Rouge River supports a variety of warmwater fish common to mid- and lower reaches of other area watercourses. However, the entire portion of the Rouge River within the study area limits also supports seasonal (spring and fall) runs of migratory salmonids and is being managed by MNR as a coldwater fishery. Upstream distribution is restricted by a dam located just west of Highway 48 at the Milne Reservoir.

Significant fish of the Rouge River are comprised of both warmwater and coldwater species. Largemouth bass, a significant warmwater sport fish, has been collected from the Rouge River at 14th Avenue by the MTRC (unpubl. data). Seasonal coldwater migratory species of Lake Ontario include coho and chinook salmon, and brown and rainbow trout.

The vulnerable redbside dace (Clinostomas elongatus) has been collected at numerous locations in the headwaters of the Rouge River over 8 km upstream of the study area. Field inventories conducted by MTO on July 4, 1996 revealed the presence of stocked rainbow trout (Oncorhynchus mykiss), rockbass (Ambloplites rupestris), white sucker (Catostomus commersoni) and a variety of cyprinids at the sample locations. Despite extensive sampling, no redbside dace were captured at the 1996 sample locations.

Within the study area, the Rouge River is generally characterized as a wide, moderate gradient, lower order watercourse flowing through deeply incised forested valleylands. Stream width varies from 25 - 35 m; flows vary from 30 cm/sec (summer) to 100 cm/sec (winter); and depths vary from 25 cm (riffles) to 150 cm (pools). Mature riparian vegetation, which covers much of the river banks, is comprised of mixed species (maple, cedar, willow, ash) and provide abundant shading of the watercourse. Instream cover is limited to scattered boulders. Instream vegetation is scattered, but limited. Bottom substrates are dominated by soft, fine sediments with pockets of rubble and gravel. High suspended solids concentrations were observed in the River which may limit fish abundance and diversity.

Because of the presence of rainbow trout within the study area, the Rouge River should be classified as supporting a resident coldwater fishery as well as migratory salmonid runs. The fishery therefore has a high level of significance.

Little Rouge Creek

Little Rouge Creek is designated as warmwater fisheries habitat throughout the study area, based on 1989 information sources. However, it is being managed by MNR as a coldwater system. Little Rouge Creek has recently been identified as supporting migratory salmonoid runs. Despite partial barriers located at the Pickering Town limit (Park Dam) and at Steeles Avenue (Woodland Park Dam), migratory trout and salmon have been observed north of the study area where the Creek crosses Highway 48 (MTRC, pers. comm.).

Several significant species have been collected from locations on the Little Rouge Creek. These include the provincially rare central stoneroller (Campostoma anomalum), and the regionally rare hornyhead chub (Nocomis biguttatus) and stonecat (Noturus flavus). Specimens of the vulnerable redbside dace have been collected from the headwaters of Little Rouge Creek. However, there is no record of their collection within the study area boundaries. MNR advises that migratory runs of coldwater salmonids are known to travel through the study area.

Inventories conducted during the summer of 1996 revealed the presence of rainbow trout, basses and baitfish including the vulnerable central stoneroller at the sample locations. Habitat conditions would allow the central stoneroller to spawn within the riffle areas at the sample locations and therefore should be considered important habitat for this species'

survival. Despite extensive surveying, redbreasted sunfish were not observed at the sample locations.

Similar to the Rouge River, the Little Rouge Creek is located within a deeply incised forested valley over the majority of the study area. The Creek channel is predominantly characterized by a pool-riffle-run configuration and an average width of approximately 5-8 m. The depth ranges from 35 - 75 cm and the flows range from 30 cm/sec (summer) to 75 cm/sec (winter).

Petticoat Creek Watershed

Headwaters of the Petticoat Creek watershed rise in a small portion of Lots 9 and 10 in the 10th and 11th Concessions in the Town of Markham. The headwater tributaries originating in the study area are seasonally intermittent (surface water runoff) and represent low potential as fish habitat. The fisheries inventory survey conducted in 1996 revealed no fish species or habitat in the Petticoat Creek and its tributaries at the 1996 sample locations. Petticoat Creek is classified as a warmwater intermittent watercourse. All of the tributaries were agricultural swales with no fisheries significance at the sample locations.

Duffins Creek Watershed

The Duffins Creek watershed is a complex network of headwaters, mid-reaches and lower reaches which dominate the central portions of the study area. The principle watercourse (lower reaches) of the watershed in the study area is the **West Duffins Creek**. Major tributaries within the study area drain to Duffins Creek and include **Ganatsekiagon Creek**, and **Urfé Creek**. These tributaries are classified as coldwater fish habitat by the MNR Maple District. Potential coldwater habitat has also been designated for several tributaries which would provide suitable habitat following some degree of rehabilitation or restoration. Resident coldwater species in these streams are brown trout and brook trout. Seasonal runs of migratory coldwater species (rainbow and brown trout, chinook and coho salmon) from Lake Ontario are well documented for West Duffins Creek. In addition, Atlantic salmon (*Salmo salar*) were introduced into Duffins Creek in 1995 in an attempt to establish lake run populations. The Whitevale Dam somewhat restricts the upstream movement of these coldwater species.

Although the nationally vulnerable redbreasted sunfish has been collected in the coldwater segments of West Duffins within the study area, none were collected at the sample locations during the 1996 inventory program. No other significant species have been documented for this watershed.

Fisheries habitat of **West Duffins Creek** is noted to be excellent throughout the study area. This characterization is based on an abundance of sand, gravel and rubble substrates, stream velocity estimated between 50 - 80 cm/sec, and a high percentage (up to 80%) of undercut banks which provide instream cover. The Creek exhibits an extensive pool-riffle

configuration thereby providing a diversity of habitat types. Backwater areas were noted to act as depositional zones for fine sediments. During the inventory studies conducted during the summer of 1996 the following species were captured - white sucker, pumpkinseed (*Lepomis gibbosus*), mottled sculpin (*Cottus bairdi*) and various baitfish. MNR also reports having sampled salmonid species from the West Duffins Creek within the study area. Again, despite extensive surveying, no reddsides were observed at the 1996 sample locations.

Riparian vegetation covered the majority of the stream banks although exposed and eroded bluffs (approximately 2.5 m high) were present north of Highway 7. Riparian communities included grasses, herbs, shrubs and mature trees (maple, cedar and elm) with forest communities dominating the northerly and southerly (Whitevale Corridor ESA) creek areas within the study area boundaries. An unnamed tributary to the east of the West Duffins Creek is also classified as a highly significant coldwater fishery, with the 1996 inventory identifying a diverse fish community including brook trout, pumpkinseed, white sucker, darters and minnows.

Major Creek, a coldwater stream which joins West Duffins Creek north of Green River, exhibited excellent physical features such as mature riparian and instream cover. However, potential was limited by low flow. **Reesor Creek** is managed by MNR for brook trout. Two tributaries to West Duffins Creek, originating in agricultural fields near Highway 7 east of the main branch, were noted to be stagnant and overgrown with emergent vegetation during mid-summer field investigations. These conditions (or dry streambeds) were also noted at numerous locations on **Urfé** and **Brougham Creeks** and several other tributaries to Duffins Creek. Although some of these streams do not maintain permanent flow at all times of the year, they do provide habitat throughout the year in isolated pools. These watercourses may be seasonally important to the fisheries resources of the watershed. **Urfé Creek** is classified as a warmwater baitfish stream with moderate significance but is managed by MNR as a coldwater intermittent system. MNR reports rainbow trout and mottled sculpin being captured from Urfé Creek between Concessions 4 and 5. Similarly, **Spring Creek**, to the east, appears suitable to support a fishery. However, it also appears to be seasonally flow-limited. Substrates, riparian cover, and configuration of this Creek are conducive to the requirements of coldwater species. These watercourses may be seasonally important to the fisheries resources of the watershed. A tributary of Duffins Creek, often called **Brougham Creek**, that crosses Highway 7 east of the Village of Brougham supports a diverse coldwater fish community dominated by brook trout. This community also includes white sucker, mottled sculpin and various minnow species. Despite intensive surveys in 1996, reddsides were not observed at the sample locations. However, MNR reports that in 1996, its salmonid ecology unit captured reddsides downstream of the confluence of **Ganetsekiagon Creek** and its tributaries south of Concession Rd. 5.

Land use throughout the majority of the watershed is presently in agricultural usage. The communities of Whitevale, Green River, and Brougham are located on various tributaries

and branches of the watershed. Residential estates are becoming more prevalent throughout the area.

Fisheries management activities in the Duffins Creek watershed are widespread. Conservation areas and ESA's have been designated on both branches of Duffins Creek. In 1995, the MTRC initiated an Authority-wide plan for the protection and enhancement of riparian habitat. As well, an MTRC comprehensive basin management strategy was underway in this watershed. Instream management activities include bank stabilization projects (East Branch - MTRC, Metro East Steelhead and Salmon Fishermen (MESSF)), and stream clean-ups (East Branch - MESSF) coordinated by the MNR under the Community Fisheries Involvement Program (CFIP) and Strategic Plan for Ontario Fisheries (SPOF) initiatives. The Maple District Office of the MNR has also conducted stream rehabilitation projects at several locations of both main branches of the Duffins Creek watershed.

Significance and Sensitivity

The most significant issue, common to all watercourses regardless of their designation, will be the potential loss of fish habitat resulting from the proposed highway/transitway facility. The coldwater streams and tributaries of the study area represent an important component of the diverse fisheries resources of the area. Resident populations of brook and brown trout are frequent in the study area and provide a significant local fishery. This fishery provides quality fishing opportunities to large numbers of anglers due to the rarity of coldwater streams in southern Ontario and its proximity to large urban centres. Water quality parameters characteristic of these watercourse types are sensitive to land and/or water use changes which are generally associated with urbanization and agriculture. As such, the protection of water quality and physical features associated with coldwater fish habitat were considered an environmentally significant component of the project.

The environmentally significant issue of rare and vulnerable fish species has also been identified. Several regionally and provincially rare and vulnerable species are resident within the study area watercourses. It is the mandate of the MNR, and a goal of all public and private interests, to prevent the extinction of any native fish species.

Finally, the long-term impact of highway/transitway development on the fisheries resources of the study area represents an environmentally significant issue. Impacts of vegetation clearing, erosion, stormwater runoff, increased water temperature, road deicing compounds and other contaminants, channelization, disruption of baseflows and toxic spills of deleterious materials have the potential to threaten the maintenance of a healthy aquatic community. Mitigation measures and design considerations will require a combination of established and creative techniques to protect these resources.

Significant features/issues of the study area related to the fisheries of the study area watersheds are summarized as follows:

- crossing of deeply incised forested river valleys having high quality existing and potential fisheries resources;
- potential displacement/alteration of existing and potential critical fish habitat;
- potential impacts to mature riparian vegetation;
- presence of significant (recreational, uncommon, rare, vulnerable or endangered) fish species;
- priority management (rehabilitation/enhancement) areas;
- potential impacts of contaminants associated with roadway runoff and spills; and
- potential disruption of groundwater upwelling areas supporting coldwater fish habitat.

4.2.5 Terrestrial Ecological Features

Information regarding terrestrial ecological features within the study area was obtained from 1) literature sources regarding Environmentally Significant Areas (ESAs) published by the Metropolitan Toronto and Region Conservation (MTRC, 1982) and the Ministry of Natural Resources land use documents (MNR, 1983a, 1983b) and Forest Resource Inventory Maps, 1978; and 2) observations from field reconnaissance during summer and fall of 1989 and 1990. Field observations were complemented by reference to additional literature sources and discussions with personnel from the MNR Maple District and Lindsay District, and the MTRC.

A preliminary examination of the entire study area in 1989 provided information used to identify the locations for alternate routes. In 1990, more detailed information was gathered to assess the potential impact on features near the various route alternatives. Terrestrial biology features are illustrated in Exhibit 4.2.1. A brief description of the relevant features is presented in Appendix 4. A list of common and scientific names of plant and animal species mentioned in this report are presented in Appendix 5. In 1995 a detailed assessment of terrestrial resources along the technically preferred route was carried out to facilitate the design process. The results of this study are presented in Appendix 20.

Vegetation

Vegetation is presented primarily in terms of the dominant types that serve to characterize vegetation units. Because of the extensive agricultural activity that has occurred in the region of southern Ontario, most of the remaining natural vegetation is found along stream courses, and in remnant woodlots of various sizes.

Remnant upland mature woodlots usually are dominated by sugar maple, with lower densities of beech, hemlock and white ash, with basswood, and black cherry sometimes found near the edges. Sugar maples in these stands are generally up to 35 cm diameter at breast height (dbh), though some individuals may be much larger (80 cm dbh). Scattered tall white pines are often associated with these woodlots. Of particular note were two woodlots in the Town of Markham in the vicinity of the new Markham Bypass. These woodlots formed a planning constraint in this area.

The vegetation along stream valleys, excluding segments in agricultural fields, varies from open flood plains with differing amounts of meadow, old-field, and shrub vegetation, to closed tree canopies, and often with mosaics of these various types. The open flood plain areas are basically wet old fields, dominated by asters, goldenrods, grasses such as reed canary grass and in very wet places, cattails. Willows, hawthorns and red-osier dogwood are shrubs commonly associated, and where the forest communities are very well developed, a familiar pattern is one with dense groves of eastern white cedar in the lower, less well-drained areas, often with large crack willows at streamside, with sugar maples and other upland species, such as beech, hemlock and red oak located higher on the valley slopes.

Conifer plantations are relatively few and most are small. Sugar maples are common hedgerow trees in the study area, many having been planted at roadside a number of years ago. Some of these hedgerow maples have attained considerable size (e.g. 95 cm dbh). Other hedgerow tree species include white and red ash, basswood, mountain ash, red maple, crack willow in wetter areas, bur oak, black cherry and eastern white cedar. In some cases, smaller trees and shrubs form the hedgerow or are present as an understory; these include hawthorns, chokecherry, common buckthorn, river-bank grape and staghorn sumac.

Old field vegetation, in addition to flood plain areas, is located throughout, usually in small plots, often in corners of rectangular areas and in lower wet areas. These communities are normally dominated by asters, goldenrods and various forage grasses. Eventually, these communities become invaded by woody species such as hawthorns, thence becoming scrub communities. Scrub communities on the study site vary in composition with common species including white elm, trembling aspen, eastern white cedar, hawthorns and common buckthorn.

"Environmentally Significant Areas" (ESA)

The only ESA in the study is the *Whitevale Corridor (MTRC ESA 98)*. This ESA extends into the study area from the south along West Duffins Creek. This highly diverse area has predominantly white birch, beech, sugar maple and hemlock on the valley slopes; and extensive groves of eastern white cedar along the valley bottom. Mosaics of wet old fields and cattail marshes, some of which are extensive, occur on the flood plain. Some Carolinian tree species are in the area, including blue beech, black cherry, and black walnut. Also, regionally rare ladies' tresses (*Spiranthes casei*) have been found here.

Wetlands

The wetland units in the study area are small. Those in proximity to route alternatives are described in Appendix 4. Only two wetlands in the study area are MNR classified (i.e. one Class 4 and one Class 7 wetlands (regionally significant)). These formed a constraint when developing route alternatives.

The *Whitevale Corridor Wetland (Class 4)* includes Whitevale Pond and attendant marshes in the West Duffins Creek system and is part of the Whitevale Corridor ESA.

The *Brock Road Wetland (Class 7)* is in the southeast corner of Brock Road and Concession Road 7. It is a cattail marsh surrounded by white cedar and red maple swamp.

Trails

The North Pickering (Seaton) Hiking Trail, created by the Ontario Ministry of Housing and administered by the Ontario Realty Corporation, represents an additional sensitive area. The 7 km Trail is located along the West Duffins Creek Valley and traverses a complex of natural ecosystems which provides unique habitat for a variety of terrestrial and aquatic organisms. The Hiking Trail is made up of three components: a walking trail; a wilderness trail; and a heritage trail. These trails, respectively, highlight scenic views, natural environmental features, and the natural and cultural history of the area. Each portion of the Hiking Trail includes numerous interpretative and lookout locations.

Significance and Sensitivity

In general terms, the major terrestrial features to be considered environmentally sensitive are woodlands, rare or otherwise significant species or assemblages, wetlands, watercourses, and the Seaton Trail. Efforts should be made during route planning to minimize the encroachments on these features. During the design phase, detailed terrestrial inventory information should be used to develop the design in order to minimize vegetative removals and to develop watercourse crossings that are sensitive to the need to protect habitats and continuity of travel corridors for both wildlife and people.

4.2.6 Wildlife and Wildlife Habitat (Terrestrial Biology)

Within the study area, natural areas are limited to remnant features along the major watercourses that flow mostly in a north - south direction across the study corridor. Most of the forested blocks in the study corridor are less than 200 m across with only one along West Duffins Creek approaching 400 m in width. Most of the natural areas are narrow strips of forest and shrub thicket habitats along these watercourses. More extensive and significant terrestrial habitats occur to the south of the study area within the Rouge Valley Park and along the lower portions of West Duffins and Ganatsekiagon Creeks. It should be noted that wildlife species that thrive in fragmented landscapes (e.g. white tailed deer) will move freely across open areas between blocks of forest cover.

Birds

Information from the *Atlas of the Breeding Birds of Ontario* (Cadman et al. 1987) was reviewed for the 10 by 10 km squares (PU 45, 46, and 56) in which the study corridor is located. The Atlas lists 98, 96, and 100 species respectively for the above mentioned squares. The majority of the species recorded in the Atlas were habitat generalists that are

common in rural and urban landscapes throughout southern Ontario. Of note, however, were numerous species of conservation interest (i.e. forest interior, area sensitive, or uncommon forests species) in each of the Atlas blocks. These species are likely associated with the larger forested areas along the Rouge River, Little Rouge Creek and West Duffins Creek. The species assemblage of PU 45 is likely especially influenced by the habitats contained within the Rouge Valley Park.

Data from the Ontario Birds at Risk (Austen et al. 1994) and breeding bird atlas (Cadman et al. 1987) were also reviewed to determine whether any significant bird species have been recorded in the study area during recent years. A total of five species were identified from the three Atlas blocks that cover the study area. Only two of these species (Red-shouldered Hawk and Cooper's Hawk) have been identified as Provincially vulnerable (based on MNR 1994). Cooper's Hawk, however, has recently been downgraded and is no longer considered Provincially vulnerable (Natural Heritage Information Centre [NHIC] pers. comm.). The other three species (American Coot, Black Tern, and Orchard Oriole) have been designated by Austen et al. (1994) as either rare or threatened.

Suitable habitats for American Coot, Black Tern and Red-shouldered Hawk do not appear to be present within the study area. Both American Coot and Black Tern require extensive wetland areas and Red-shouldered Hawks require extensive forested areas (the last breeding record of a Red-shouldered Hawk in Rouge Valley Park was 1985 (Varga et al. 1991)). The Orchard Oriole, however, is a species that nests in suburban areas, campgrounds, hedgerows, roadsides, open second-growth woodland, lightly wooded rivers, and partly open fields with scattered trees (Austen et al. 1994, 140); habitats which are all common within the study corridor. In this respect, Orchard Orioles do not appear to be limited by lack of suitable nesting habitat, but rather, are sparsely distributed because they are located at the northern most limit of their natural breeding range.

Mammals

Based on information provided in the Atlas of the Mammals of Ontario (Atlas blocks PU 45, PU46, and PU56 - Dobbyn 1994) and data from the Natural Areas of Durham Region (Bain et al. 1989) there are no records of Provincially significant mammal species within the study area (status based on MNR 1994). The majority of the species recorded for the area are habitat generalists that are common in rural and urban mosaics throughout southern Ontario with examples being Northern Short-tailed Shrew, Eastern Cottontail, Eastern Chipmunk, Woodchuck, Meadow Vole, Gray Squirrel, Red Fox, Raccoon among others.

The less well known and difficult to record species such as shrews and moles appear to be absent from the general database, although records of Smokey Shrew, Common Shrew, Star-nosed Mole and Hairy Tailed Mole are provided by Bain et al. (1989) for the West Duffins Creek system which is partially within the study area, and all of the above as well as Pygmy Shrew have been identified within the Rouge Valley Park to the south of the study area. None of these species are considered to be Provincially Significant (status

based on MNR 1994), although Smokey Shrew is considered Provincially Significant for the purposes of a wetland evaluation. Otherwise it is identified as being a common to very common species (i.e. NHIC ranking of S4-S5). This species prefers damp sites in deciduous or mixed forests with abundant leaf litter, rotten logs, and stumps (Van Zyll de Jong, 1983)).

Reptiles and Amphibians

No Provincially significant reptile or amphibian species are known from within the study area. It is expected, however, that a common array of species are present in their respective habitats (e.g. Green Frogs and Midland Painted Turtles in areas with permanent water; Spring Peepers, Wood Frogs, Eastern Red Spotted Newts and *Ambystoma* Salamanders in woodlands with ephemeral or vernal ponds; Redback Salamander in mature well-drained woodlands with an abundance of forest floor debris; and Leopard Frogs, American Toads and Eastern Garter Snakes in a variety of habitats throughout the study area). Amphibian and reptile records from the Rouge Valley Park to the south of the study area support this general species assemblage (Varga et al. 1991).

Significance and Sensitivity

In general, wildlife is dependent on habitat which is determined to a large degree by vegetation. Stream corridors with attendant vegetation, mature and successional upland and lowlands forests, and wetlands provide especially important wildlife habitat. Hedgerows and old-fields also provide wildlife habitat but are somewhat less important overall.

The most significant issues with respect to wildlife is the potential effects on the corridor value of a number of stream valley systems which any route alternative would cross. The Rouge River, Little Rouge Creek and West Duffins Creek are very important in this regard. Bird species diversity is especially high in these systems, and the systems provide an important north-south linkage between the Oak Ridges Moraine and Lake Ontario.

More specifically, MTRC (1982) observed that the *Whitevale Corridor* is a particularly valuable wildlife habitat. Over 200 bird species have been observed in the area, including a good ruffed grouse population. The area had been identified as a deer yard, but this is not corroborated by MNR (1983a); a deer yard, *per se*, is unlikely, but this is a significant area of winter deer concentration.

East-west travel corridors are also important for linking smaller north-south corridors that may be severed, with larger more continuous valley corridor systems.

Since the valley systems are oriented in a north-south direction, they cannot be avoided with an east-west oriented transportation corridor. However, route alternatives should be identified with consideration given to avoiding the more significant areas. Because it is not possible to avoid crossing the valley systems, stream crossing design will need to give consideration to minimizing disruption to wildlife corridors.

4.2.7 Ecosystem Integrity

For the purposes of this study, the following definition of an "ecosystem" has been adopted:

"An ecosystem consists of air, land, water and living organisms, including humans, and the interactions among them. An ecosystem includes the community of living things and the complex of physical and chemical factors forming the environment."¹

The generally accepted primary boundary for an ecosystem approach to **land use planning** is the watershed or subwatershed. However, MOEE also acknowledges that the use of other boundary definitions of ecosystems may be more appropriate depending on the application.² The nature of linear facilities, such as **transportation corridors** lends itself more to consideration of other biophysical boundaries which are defined physiographically. In this respect, local aquatic, upland and wetland ecosystems were adopted for consideration since they are the most prevalent ecological units in the study area.

The three general categories of natural ecosystems existing in the study area are described below:

Uplands

The natural upland systems in the study area include mature upland deciduous forests (or remnant woodlots), successional woods, scrub woodlands, and old fields. The general order of ecological succession is that old fields become scrub woodlands, which become successional woods, which ultimately become mature (or climax) forests. The time to maturity or climax may vary from one situation to another. Some steps may effectively be by-passed, and some successional stages may persist for literally hundreds of years (e.g. white pine stands). Natural disturbances such as fire, or man-induced disturbance, may also disrupt the idealized sequence of plant communities.

Somewhat paradoxically, most of the forested areas in the study area are in direct association with drainage ravines, both on the flood plain and along the stream or river proper, and are sometimes referred to as lowland forest. In spite of the proximity of permanent streams and the associated water table, these stream-side forest systems are considered upland in this study, except in the cases where the "wetland" definition clearly applies. This distinction is very often the result of a value judgment. Brief descriptions of the types of upland systems found in the study area are as follows:

¹ Ministry of Environment and Energy, "Water Management on a Watershed Basis: Implementing an Ecosystem Approach" (Toronto, June 1993) p.1.

² Ministry of Environment and Energy, "Toward an Ecosystem Approach to Land Use Planning" (Toronto, September 1992) p.5.

Mature Upland Deciduous Forest are generally on well-drained areas and are dominated by sugar maple, with lower densities of beech, white ash, and hemlock. Black cherry and basswood are often included, especially near the forest edge. Red oak and scattered tall white pine are often associated with these communities.

Successional Woods are dominated by rapidly growing shade-intolerant tree species with white birch, trembling aspen, and large-toothed aspen being the more common types. These communities will eventually be succeeded by more shade-tolerant species such as sugar maple and beech.

Scrub Woodland communities normally result from invasion of old field communities by species of small tree/shrub size, along with seedlings and saplings of successional tree species. Common components of scrub woodland in the study area are hawthorns, common buckthorn, eastern white cedar, white elm, white birch and trembling aspen.

Old Field communities generally occur when plowed and pasture lands are no longer used, thereby allowing the more natural course of events to proceed. Other forms of disturbance, such as changes in drainage patterns and fire, may set the stage for old field succession. These communities normally are dominated by asters, goldenrods, and introduced grasses. Various shrubs may be associated in the progression toward a community dominated by successional tree species. Red-osier dogwood and willows are common shrubs in wetter old fields, and hawthorns readily invade the better drained sites.

Stream-Side Forest communities are dominated by Eastern white cedar. Other tree species found in the wetter areas of these systems include balsam poplar, ashes, red maple, crack willow and some yellow birch. Typically upland species are found on the valley slopes and immediately above. These include sugar maple, beech, hemlock, white ash, red oak, and white birch, as well as dense groves of white cedar in some areas.

Streamside and ravine slope forests are important in a number of ways. They confer stability to soil and hydrological systems, and they are important in maintaining the lower water temperatures required by salmonid fish in these streams. Further, they provide habitat for a number of wildlife species as well as forming wildlife corridors through the area.

Wetlands

Wetlands in the study area include marshes, and small man-made or natural ponds. No examples of peat-based wetlands (bogs and fens) were observed.

Marshes

Marshes are characterized by the presence of standing or slowly moving water which at least periodically inundates an area, in association with a characteristic array of non-woody

plants including cattail, rushes, and sedges. Marshes on the study site vary from dense cattail expanses to small open water marshes.

Ponds

A number of small ponds, either natural or man-made, occur in the study area, and are usually attended by characteristic vegetation such as cattails and sedges.

Aquatic Systems

Aquatic systems in the study area vary according to their source of water supply and distance from this source. Size and configuration of these systems are dictated by topography and the geological setting of the area. Additional variation between these systems occurs when abiotic effects, such as light penetration, vary. All of these variables, which characterize the watercourses of the study area, determine the biological community within each system.

Types of aquatic systems found in the study area include headwaters, tributaries and rivers. Generally, headwaters are small, first order watercourses emanating from a subsurface water supply, or supplied by surface water runoff from the terrestrial environment. Flow may be continuous or intermittent. Coldwater headwaters in the study area originate on the Oak Ridges Moraine. As these headwaters join together, larger order streams are formed (mid-reaches) and characterized by larger volumes of continuous flow. Similarly, as these streams merge lower in each watershed substantial river branches (lower reaches) are formed. The Rouge River and Little Rouge Creek provide examples of large watercourses which are found in the study area. Within this general pattern, variations such as marshes and ponds may be found, created by natural or man-made depressions or obstructions. Whitevale Pond, located on West Duffins Creek was created through the installation of the Whitevale dam, for example. Watercourse size and quality, therefore, is the product of the number of upstream tributaries and their combined volume and quality. Changes to upstream qualities such as site specific enhancements and losses (including upwelling areas), changes in cover, availability of substrate, degree of vegetative cover, stabilization of banks, alteration of drainage, and temperature/stormwater impacts, can affect downstream conditions.

Basin topography plays an important role in the characterization of each aquatic system affecting watercourse velocity and configuration. Deep valley rivers, with high gradients, like Little Rouge Creek, are swift moving while low gradient grade creeks meander through old fields and pastures over much of their length. Combinations of topography and resulting flow regimes occur frequently within most watercourses.

Basin geology also contributes significantly to the overall characterization of each watercourse determining stream substrates and water temperature and chemistry. As well, stream configuration, such as the pool-riffle complex or pronounced meanders, is determined by bank slopes and stability.

The availability of light to the watercourse surface, which varies with the amount of adjacent vegetation, will affect its heat content and biological productivity. Shaded and open areas are common within a watercourse and create discrete habitats within each aquatic system.

The wide variety of watercourses, shaped by the abiotic conditions present in the study area, dictate the distribution, abundance and diversity of the biotic community of each aquatic system. The availability of light in slow moving creeks, for example, may allow the establishment of filamentous algae, which in turn may provide food for the omnivorous common shiner and central stoneroller. In contrast, the well wooded headwaters of West Duffins Creek keep water temperatures low, which are then able to support coldwater species such as brook and brown trout. Groundwater recharge and discharge as baseflow to watercourses are also important functions in maintaining coldwater fisheries.

As a result of the wide variation in stream characteristics, the aquatic communities of the study area watercourses similarly vary. Coldwater and warmwater streams are located throughout the study area. The Rouge River exhibits high concentrations of bacteria and suspended particulates while these concentrations are low in the waters of Duffins Creek. Spring Creek provides fish habitat on a seasonal basis as it relies on surface water runoff as its source. Conversely, the complex network of tributaries to West Duffins Creek provides continuous flow and quality fish habitat, while the warmwater swales of Petticoat Creek's headwaters are generally unsuitable for fish.

Significance and Sensitivity

The various natural features cannot be taken strictly in isolation. Their interconnectedness must be understood and considered when comparing and assessing the effects of the various alternatives under consideration.

Ecosystem principles should be considered when assessing impacts and evaluating the alternative routes. During the design phase the functional relationship of drainage to groundwater impacts and fish habitat should be considered when developing stormwater management approaches. The importance of vegetative communities to fish and wildlife habitat and travel corridors should also be considered during the design process.

4.3 AGRICULTURE

Agricultural activities were considered significant enough in the overall Highway 407 study area to warrant an assessment separate from other economic activities. The following provides a brief summary of the key agricultural considerations for this study.

4.3.1 Soils and Agricultural Capability

The entire study area is dominated by loams in the Woburn and Milliken soils series. There are some Peel and Cashel clays along the Durham-York Line and in the northwest corner of the study

area (16th Avenue and Ninth Line). Clayey material constitutes only about 3% of all study area soils. There is also a finger of poorly drained Lyons loam through the tableland between the Rouge River and Little Rouge Creek. With the exception of the cited clay soils, Lyons loam and small isolated wet areas which are poorly drained, study area soils exhibit good drainage.

The study area is comprised predominantly of soils with high capability to support agriculture (i.e. Class 1 and 2 soils). In many areas, Class 1 and 2 lands occur in combination, with the proportion of Class 1 lands ranging from 50% to 80%. Class 2 land in these combinations exhibit some limitations related to topography associated with either steepness of slopes or topographic configuration (refer to Exhibit 4.3.1).

Since the entire study area contains high quality farmland the occurrence of Class 1 and 2 lands was not considered a major constraint in developing route alternatives. Other agricultural features, such as farm operations and facilities, were considered more important in this respect.

4.3.2 Farm Operations and Facilities

An analysis of farm operations and facilities was carried out using:

- Agricultural Resource Inventory (ARI) 1983 mapping (OMAF, 1:50,000 and 1:25,000);
- field reconnaissance;
- aerial photographic interpretation;
- consultation with OMAFRA and the Durham Region Federation of Agriculture;
- personal communication with individual operators on an opportunistic and as required basis (Public Information Centres and on-site meetings);
- the 1986 Agricultural Census of Canada, prepared by Statistics Canada in 1987;
- Region of York and Region of Durham agricultural figures; and
- "Report on the Status of Agriculture in Durham Region" as prepared by the OMAF Foodland Preservative Branch (July 1988).

During the initial data collection phase, Locally Significant Agricultural Enterprises (LSAE's) were identified as possible (but not absolute) constraints to the generation of route alternatives. Study area LSAE's included dairy milking systems, beef feedlot systems, major cash crop operations, nursery stock producers, orchards and berry operations.

The study area includes three individual or combined (for reasons of confidentiality) enumeration areas (EAs). The following describes these areas.

- Markham (Enumeration Area (EA) 002)
 - less than 25% of farm land is owner-occupied
 - approximately 80% of land rented is leased from the Ontario Realty Corporation (ORC)
 - tenure status reflected by low relative capital value of land/buildings

- farms are relatively large (average 89 ha) with significant proportion of farm area under crops (82.2%)
 - profitable operations (average annual sales exceed operating expenses by 30%) with the largest proportion (44%) of farms reporting sales of over \$100,000, including 4 farms with sales of over \$250,000
 - potentially affected LSAE's include 2 cash crop operations, both leased from ORC
- West Pickering north of Highway 7 (EA's 320 and 321)
 - lands on Pickering Airport Site; virtually all lands leased
 - large farm size (Average 115 ha) with high proportion under crops (85%)
 - lowest degree of off-farm non-agriculture work
 - even distribution over range of sales of agriculture products
 - primarily cash crop and specialty crop operations
 - lowest capital value per unit of land and among the lowest average value of land/buildings per farm
 - potentially affected LSAE's include 1 dairy, and 1 beef, both leased from Public Works and Government Services Canada (PWGSC)
- Pickering south of Highway 7 (EA 317)
 - about 50% of this area included in Seaton Community but 79% of area is rented, 54% of this from non-government source (urban fringe holdings)
 - among the highest capital value holdings
 - covers a broad cross-section of operation types mainly because it covers an extensive east-west segment of study area and follows the general study area pattern in this regard
 - only moderately successful operations (56% with sales of \$10,000 and over and 6% with sales of \$100,000 and over); small revenue over expenses margin
 - potentially affected LSAE's include 1 cash crop operation

Transportation Routes

The farm transportation network is extensive throughout most of the study area. Virtually all roads are used either for the movement of produce to market, access to service centres or movement between the home farm and other worked parcels.

Significance and Sensitivity

As an urban fringe area, the study area is coming under increasing pressure for conversion of agricultural lands to non-agricultural (urban) uses.

The extension of Highway 407 may accelerate designated conversions to non-agricultural uses as permitted in the approved Official Plans, and/or create additional pressure for the introduction of

other major non-agricultural uses (i.e. Pickering Airport, Seaton Community). The severance of agricultural transportation linkages should be minimized.

4.4 SOCIAL ENVIRONMENT

This section addresses the social fabric of the study area, concentrating on the settlement areas (communities), recreational opportunities/facilities, visual features, and noise sensitive areas/receivers.

4.4.1 Communities

Exhibit 4.4.1 identifies the key land use features in the study area at the time of Route Planning. These features are discussed in the following sub-sections. A determination of community definition and hamlet-rural area social linkages was made on the basis of designated hamlets and police villages within the planning areas of the participating municipalities, as described in their official plans and/or associated plan reviews. The York Region and Durham Region Public School Boards and Roman Catholic School Boards provided information related to school catchment areas and bus routes.





Town of Markham

Urban Communities

With a 1995 population of 65,713, the urban community of Markham (Markham and Unionville Planning District (MPD 1)) (Refer to Exhibit 4.4.2) already exceeds the estimated population capacity identified in the Town of Markham Official Plan by approximately 10.3%. Existing uses in this area include residential uses with associated institutional, personal service and office/retail commercial uses.

The other urban community within the study area is the Rouge North Community (MPD 28). In 1995, the population of this community was 363 persons. The Rouge North Community Secondary Plan, comprising of 205 hectares, includes two neighbourhoods - one north of Fourteenth Avenue (Neighbourhood 1) and one south of Fourteenth Avenue (Neighbourhood 2). The planned population for Neighbourhood 1 is 2,788 persons and the planned number of units is 875 including low and medium density residential units. The entire Rouge North Community calls for approximately 5,161 persons in 1,573 units, although the Official Plan currently identifies a capacity population of 2,700 for this community. The urban area boundary has been extended to include the Rouge Northeast Planning District (MPD 32 - approved by the Ministry of Municipal Affairs and Housing in February 1996). This new community of 120 hectares is on the former IBM golf course lands located east of the Little Rouge River. Housing densities are for approximately 1,231 dwelling units ranging from low to high density residential units, accommodating a projected population of 4,063.

legend

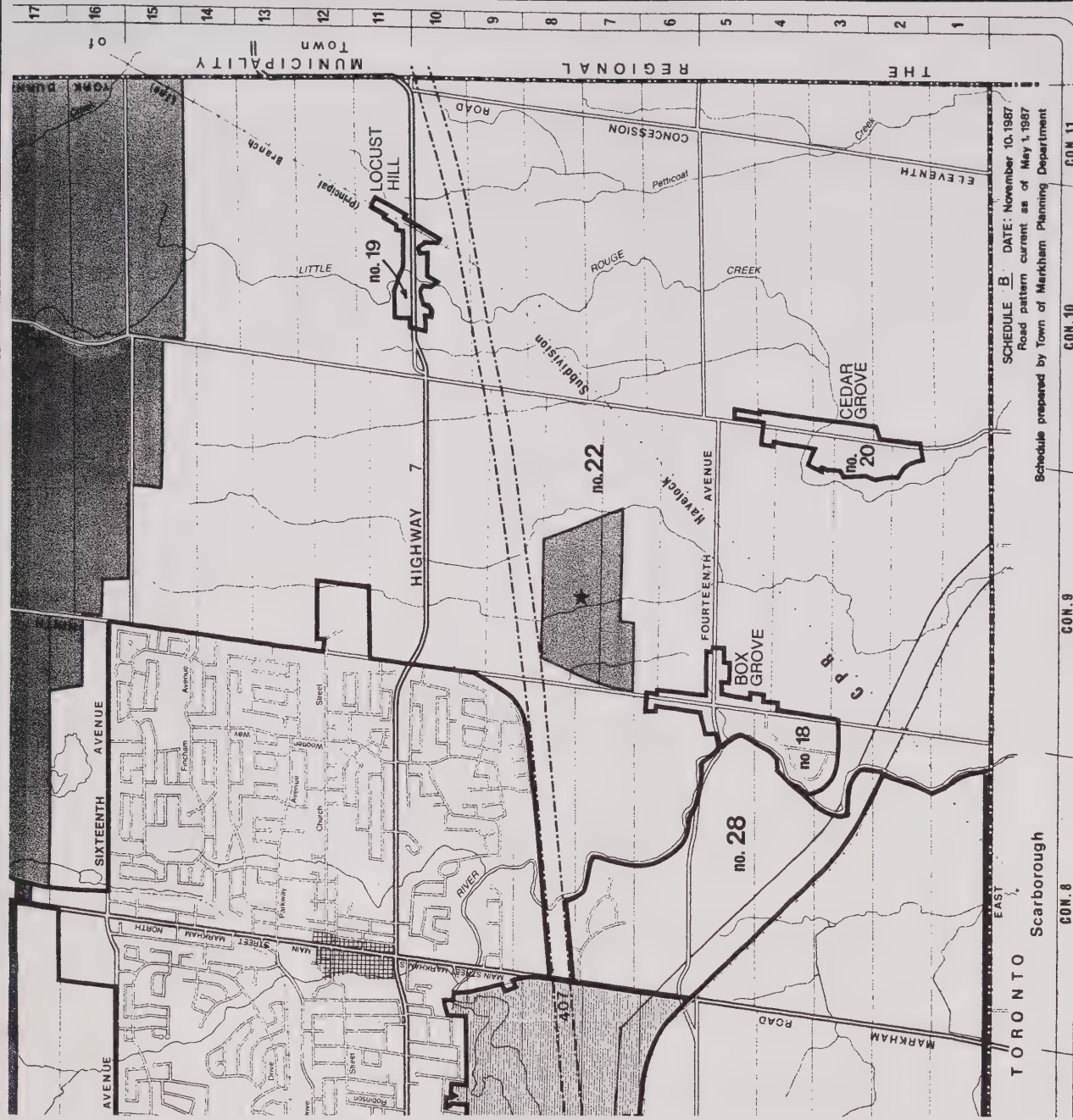
-  planning district boundary
-  lands under Minister's Order (airport)
-  lands under Minister's Order (parkway belt)
-  community improvement area

planning district

- no. 1 markham and unionville planning district
- no. 2 risebrough planning district
- no. 3 north thornhill - thornlea planning district
- no. 4 south thornhill planning district
- no. 5 thornhill industrial planning district
- no. 6 north bayview planning district
- no. 7 leslie west planning district
- no. 8 leslie east planning district
- no. 9 thornlea planning district
- no. 10 thornlea industrial planning district
- no. 11 south don mills industrial planning district
- no. 12 leslie industrial planning district
- no. 13 leslie industrial planning district
- no. 14 victoria industrial planning district
- no. 15 buttrick industrial planning district
- no. 16 almira industrial planning district
- no. 17 dickson industrial planning district
- no. 18 box grove industrial planning district
- no. 19 locust hill industrial planning district
- no. 20 cedar grove industrial planning district
- no. 21 parkway belt west planning district
- no. 22 agriculture planning district
- no. 23 north don mills industrial planning district
- no. 24 armadale industrial planning district
- no. 25 woodbine industrial planning district
- no. 26 woodbine north industrial planning district
- no. 27 buttrick industrial planning district
- no. 28 rouge north planning district

Source: Town of Markham Official Plan
Planning Area (Revised 1987)
Office Consolidation - June 1993
Schedule B

HIGHWAY 407 / TRANSITWAY
MARKHAM ROAD EASTERLY TO
HIGHWAY 7 EAST OF BROCK ROAD



PLANNING DISTRICTS AND
COMMUNITY IMPROVEMENTS AREAS
IN THE TOWN OF MARKHAM

EXHIBIT
4.4.2

The Cornell Community is bounded by Ninth Line, Little Rouge Creek and extends just north of Sixteenth Avenue. The southern boundary would be affected by the location of any extension of Highway 407 east of Markham Road. Urban development is designated on 625 hectares of land within the Cornell Community Secondary Plan. A population of 27,300 people and 10,000 residential units of varying densities is anticipated for this community. Further details are provided under the discussion on federal/provincial/municipal/private land use development (Section 4.5.1).

Hamlets

Box Grove (MPD 18) and Locust Hill (MPD 19) are two of the Town's six designated Hamlets. As currently envisaged, no secondary plans will be developed for hamlet areas but the possibility of development studies leading to Secondary Plans or detailed policies and planning guidelines has not been precluded by the Town. Generally, the current Official Plan policies stipulate that hamlet development be confined within designated boundaries; that the predominant use of land will be housing with small scale institutional and commercial uses to serve the hamlet and surrounding rural area (similar to existing uses); that residential subdivisions that would form an extension of the Hamlet Planning District will not be permitted; and that development should proceed slowly by land severance rather than by plan of subdivision.

These policies have been formulated to preserve the small scale and distinctive character of the hamlet areas and ensure the preservation and viability of adjacent good agricultural land.

Box Grove and Locust Hill had 1995 populations of 377 and 211, respectively. There are no identified committed or capacity levels in the Official Plan for these two Hamlets.

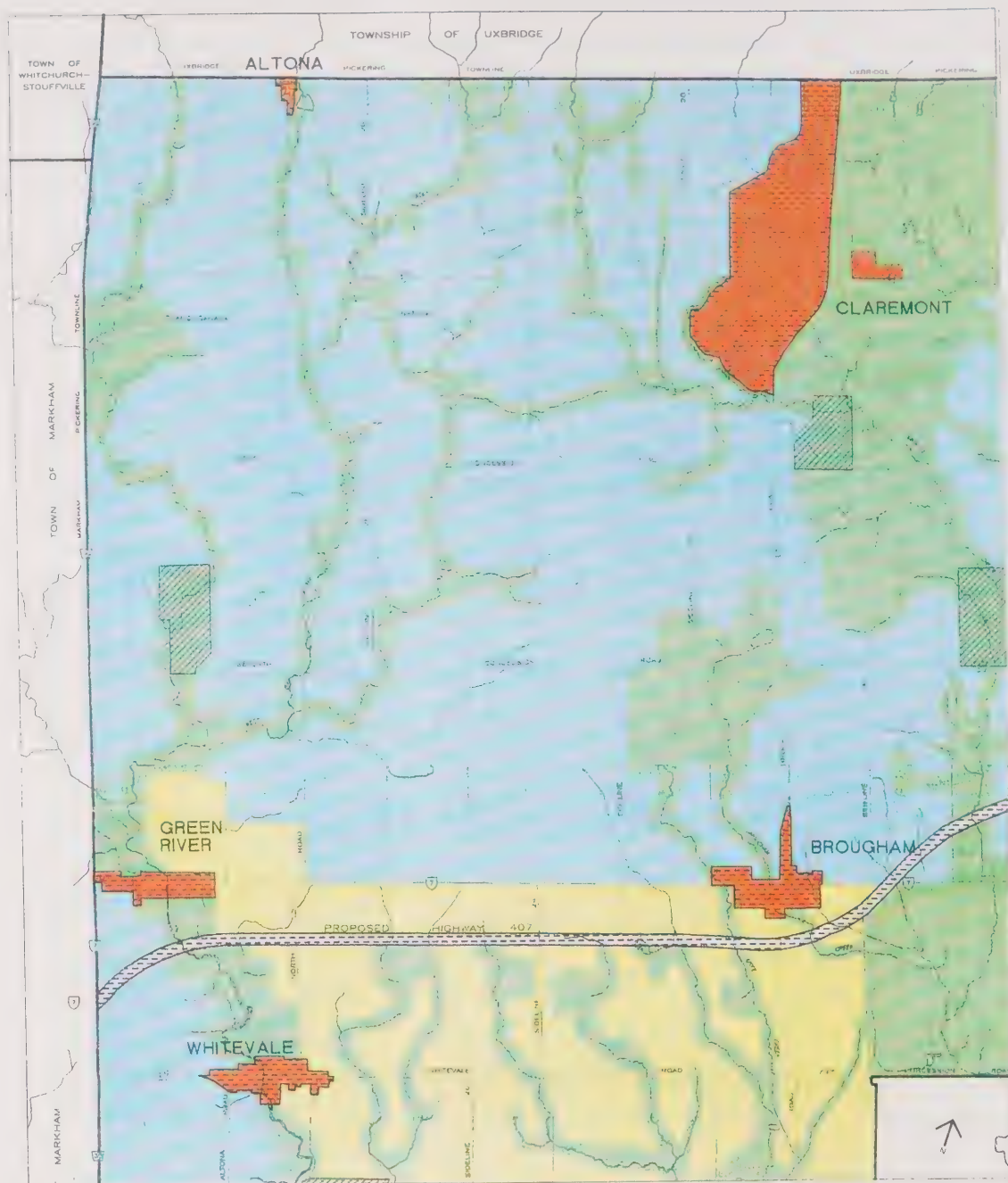
Town of Pickering

The Pickering District Plan acknowledges the importance of maintaining the character of hamlets by requiring all developments to proceed within the context of Development Plans adopted by Council.

Development Plans and implementing zoning have been prepared for all hamlets in the study area, namely: Whitevale, Green River and Brougham. Table 4.4.1, below, shows the distribution of designated land uses and existing and possible population figures for the hamlet areas. Also refer to Exhibit 4.4.3 and Exhibit 4.4.4.

TABLE 4.4.1
TOWN OF PICKERING
HAMLET LAND USE AREAS AND POPULATION ESTIMATES

	Whitevale	Green River	Brougham
Existing Development (Units/Population(1995))	74/240	35/125	77/270
Possible Development (Units/Population)	81/268	44/146	103/340
Existing Area (ha)	16.9	9.1	17.2
Designated Area (ha)	33.6	28.2	46.3
• Residential Village	19.4	12.4	27.0
• Mixed Residential/ Commercial	-	0.7	0.2
• Hamlet Commercial	0.8	-	0.3
• Commercial Core	-	-	1.8
• Hamlet Industrial	-	-	6.5
• Community Use	1.9	0.6	1.9
• Recreational Node	-	5.5	-
• Open Space	5.7	4.5	-
• Roads	5.8	4.5	8.6



RURAL SETTLEMENTS

- RURAL CLUSTERS
- RURAL HAMLETS

HIGHWAYS & MAJOR UTILITIES

- CONTROLLED ACCESS AREAS

OPEN SPACE SYSTEM

- NATURAL AREAS
- RECREATIONAL AREAS
- AGRICULTURAL AREAS
- SEATON STUDY AREA

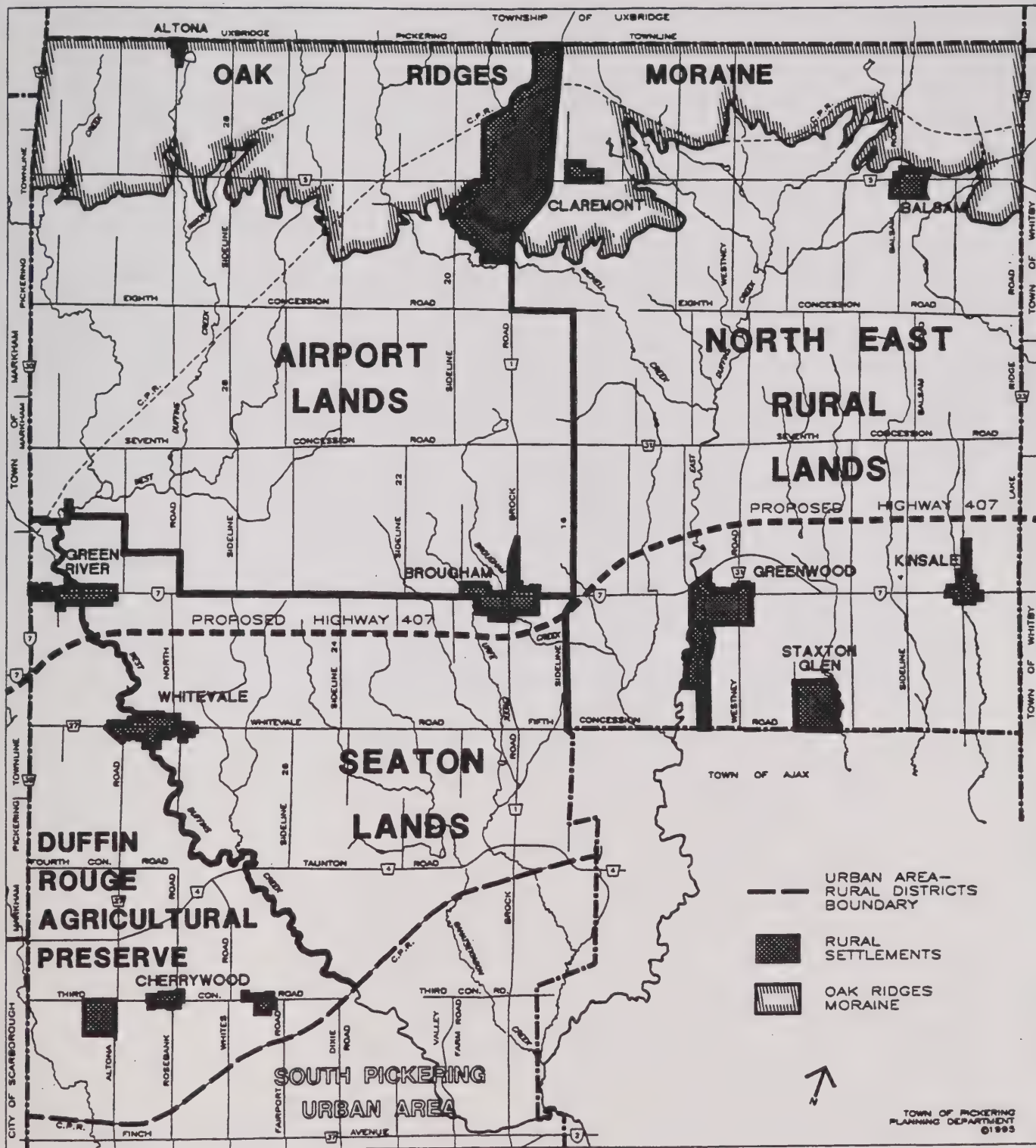
Source: Town of Pickering Official Plan, June 1995

HIGHWAY 407 / TRANSITWAY
MARKHAM ROAD EASTERLY TO
HIGHWAY 7 EAST OF BROCK ROAD

RURAL HAMLETS IN THE
TOWN OF PICKERING

EXHIBIT

4.4.3



Source: Town of Pickering Draft Official Plan, June 1995

HIGHWAY 407 / TRANSITWAY
MARKHAM ROAD EASTERLY TO
HIGHWAY 7 EAST OF BROCK ROAD

RURAL DISTRICTS IN
THE TOWN OF PICKERING

EXHIBIT
4.4.4

School Bus Routes

The study area (and access to the north) generally comprise catchment areas for schools in urban areas to the south. Consequently, many of the local and regional north-south roads serve as routes for busing students back and forth between the schools and rural pick-up points. The potential impacts to local and regional roads must recognize the need to maintain rural-urban linkages for school transportation purposes.

Significance and Sensitivity

Regional and local municipal planning policies in both York and Durham have been formulated to preserve the small scale and distinctive character of hamlet areas. Discussion with the residents of study area hamlets confirm concerns/needs relative to this objective, particularly in Whitevale, Green River and Brougham which have been subjected to significant pressures over the past 20 years from a number of sources (Pickering Airport, landfill site investigations increasing inter-regional traffic movements). Provincial and municipal concepts for Seaton have historically included the maintenance of transition or buffer zones between the new urban community and existing hamlet areas in an effort to preserve established lifestyles.

In Pickering, projected figures in the Town's hamlet development plans indicate that hamlet population in the Town could grow to over 750 in the year 2016 from its current level of 635, with increases ranging from 6% in Whitevale, 8% in Green River to 16% in Brougham.

The following 10 areas are identifiable existing or planned communities, either within or outside of incorporated settlement boundaries:

- Markham-Unionville urban community;
- Rouge North urban community;
- Rouge Northeast urban community;
- Cornell Community;
- Box Grove;
- Locust Hill;
- Green River;
- Whitevale;
- Seaton planned community; and,
- Brougham

The development and evaluation of route alternatives for the highway/transit facility should be conducted with the objective of striking a balance between avoiding direct encroachment on these areas and providing improved access (service) to ensure continued economic growth in existing areas and the development of new communities as envisioned by the Province and the respective municipalities.

Furthermore, investigations should focus on monitoring the progress of community expansion or development plans, particularly the Seaton community plan, to ensure that the aforementioned

balance between proximity effects and service function is maintained. This need is discussed further in Section 4.5.1.

4.4.2 Recreation

Many of both the active and passive recreational activities in the study area are directly related to the presence of the major north-south watercourse valleys which run between the Oak Ridges Moraine and Lake Ontario.

Provincial and municipal policies support the development of linked open space system utilizing north-south valley areas as well as east-west connectors to join major activity nodes.

A major natural and recreational feature south of the study area is the Rouge Park. The Rouge Park Management Plan (May 1994) includes a trail system that will be the primary focus for recreational activity in the Park and will be based on retaining the ecological values of the Park's significant natural areas. Other recreational activities such as cross-country skiing, canoeing and kayaking, walk-in tent camping, swimming and fishing may also be available in the Park.

In 1996, a study was initiated to develop the Rouge Park North Management Plan for the Rouge River and Little Rouge Creek valley systems as an extension to the Rouge Park. These systems currently provide existing passive recreational opportunities and in the future will serve as the major regional link connecting the Lake Ontario waterfront to the Oak Ridges Moraine. North of Steeles Avenue it is proposed that the Little Rouge corridor will be 600 m wide through the ORC (provincial) lands which dominate the study area. A study is underway to define the characteristics of the Rouge Park north of Steeles Avenue. The main north-south trail system of the Park will be located in this corridor. Therefore, the Highway 407 facility must respect the existing recreational amenities in the creek corridor as well as the needs for the future trail system. In particular, the height and appearance of the structure crossing the valley will be a sensitive design element.

The West Duffins Creek valley between Camp Pidaca at Rossland Road and Green River at Highway 7 includes the Seaton Hiking Trail, a recreational/interpretative facility developed by the Province in co-operation with the Metropolitan Toronto and Region Conservation Authority. The Trail comprises a walking trail, a wilderness trail and a heritage trail. The heritage trail includes old millworks, ponds and lowland woods, which have been used to highlight the natural/historic features of the area, as well as a large open flood plain area used by the Seaton Flying Club (model airplanes). In addition, the Pickering Rod and Gun Club is located in Lot 23, Concession 5 in the Town of Pickering.

Significance and Sensitivity

The main recreational activities are associated with the major watercourse valleys. Avoidance of these valley systems is not an option since they generally are oriented perpendicular to the transportation corridor. However, if not properly designed, the crossings can block trails and diminish the recreational experience in the area.

Bridges should be used for the stream crossing at the major valleys providing recreational opportunities. These crossings will need to be designed to maintain these recreational opportunities.

4.4.3 Visual Aesthetics

The visual inventory and analysis of the study area was conducted by the Landscape Architecture Unit of the Ministry of Transportation and the consulting firm of Todhunter, Schollen & Associates as part of the route planning investigations associated with the Environmental Assessment for the Hwy 407 / Transit Transportation Corridor.

The study corridor is characterized as follows:

Aesthetic Quality

The majority of this landscaping setting is comprised of relatively flat topography which is primarily agricultural in nature. There are some scattered upland woodlots and vegetation groupings associated with the Rouge, Little Rouge and West Duffins Creek crossings. Overall, the landscape is not considered as unique or visually distinctive. It has therefore been ranked as having moderate visual appeal.

Views from the Road

The relatively flat topography which is characteristic of the majority of the area provides little visual interest and little potential for unique vistas. Hedgerows and the occasional woodlot provide some visual definition and enclosure to this agricultural landscape, and there are some long range views of the Toronto skyline. Overall, the viewing opportunities are considered as having moderate contrast or value.

Views of the Road

The residential areas and hamlets in Markham (north and south of the old I.B.M. golf course) Locust Hill and Green River, as well as houses along Highway 7, depending on the final facility alignment, may have a view of the facility. Given the relatively short viewing distances for the majority of homes, views of the road are considered as having moderate negative impacts.

Significance and Sensitivity

The inherent quality of the landscape and the potential views from the proposed facility are not considered to be unique or distinctive.

The most significant environmental issue which must be addressed with respect to the facility route is its impact (especially of the interchanges) on the several hamlets located along Highway 7.

4.4.4 Noise

At the Route Planning Stage, a preliminary noise study was carried out in accordance with the protocol agreement between the Ministry of Transportation and the Ministry of Environment and Energy on assessing noise impacts by J.E. Coulter Associates Engineering, specialists in acoustical impact assessment and design.

The following land uses, with outdoor living areas associated with them, would qualify as noise sensitive areas for a new highway: private homes, such as single family residences; townhouses; multiple unit buildings, such as apartments with outdoor living areas for use by all occupants; and hospitals, nursing homes for the aged, where there are outdoor living areas for the patients.

For the screening level comparison, noise contours were applied assuming, for the most part, that the roadways were crossing a flat plane. In areas where the topography may significantly alter the noise impact relative to that of a flat plane, the probable effects were considered. These generally occur at the valley crossings, and are not easily assessed at this level of detail because they require more detail on vertical alignment than is available at the screening level.

All traffic volumes are compared on the basis of a 24 hour L_{eq} , that is, the sound averaged over 24 hours, with the exception of the rail noise which was averaged over 18 hours.

The identification of noise sensitive areas is summarized below for those areas where it appears that noise generated from the highway facility will be a concern. Comments start with those portions of roadway at the far west end of the study area and flow east from there.

- There will be potential noise impacts in the Town of Markham, between Markham Road and the Ninth Line, because the route is restricted by developments to the north and the south. Since there is no choice of route through this zone, noise impact assessment did not affect route choices. Opportunities for reducing noise impacts will be considered during the design phase of the project.

The houses overlooking the highway from the south near Markham Road may be affected to a degree that is difficult to mitigate. These residences (on Chatelaine Drive and Carolwood Crescent) were registered in July 1959 and were not subject to regulatory provisions related to the submission of noise impact assessments and proposed mitigation measures with development applications. To the north those residences along the south side of Colonel Butler Drive were covered by a subdivision agreement in 1982 calling for air conditioning, warning clauses on Offers to Purchase and Sale and a 1.84 m noise fence. The fence has not been installed to date. It would have the effect of lowering the sound levels in the rear yards by approximately 3 dB, leaving them at approximately 62-63 dB.

- Residences fronting on existing Highway 7, will be affected if Highway 407 is located just west of Locust Hill.
- If a northern route were to be selected, the Hamlet of Locust Hill would be affected.

- If a more southerly route were to be selected, impacts along Highway 7 are expected to be minimal east of Ninth Line, however residences on Durham-York Line, North Road and Brock Road, as well in the Hamlet of Brougham would be affected.

Significance and Sensitivity

Municipalities in the study area have indicated that no areas designated by law as "quiet zones" are present in the areas of potential impact by the facility. During the Design Phase, additional assessment of mitigation opportunities for noise increases at noise sensitive areas will be carried out.

4.5 ECONOMIC ENVIRONMENT

The assessment of the economic environment in the study area focused on federal, provincial, municipal and private sector land use developments and commercial activities. Exhibit 4.5.1 illustrates the land use initiatives in the north east part of the Great Toronto Area (GTA).

4.5.1 Federal/Provincial/Municipal/Private Land Use Development Strategies

In assessing municipal development strategies at the time of route selection and the feasibility study, reliance was placed on:

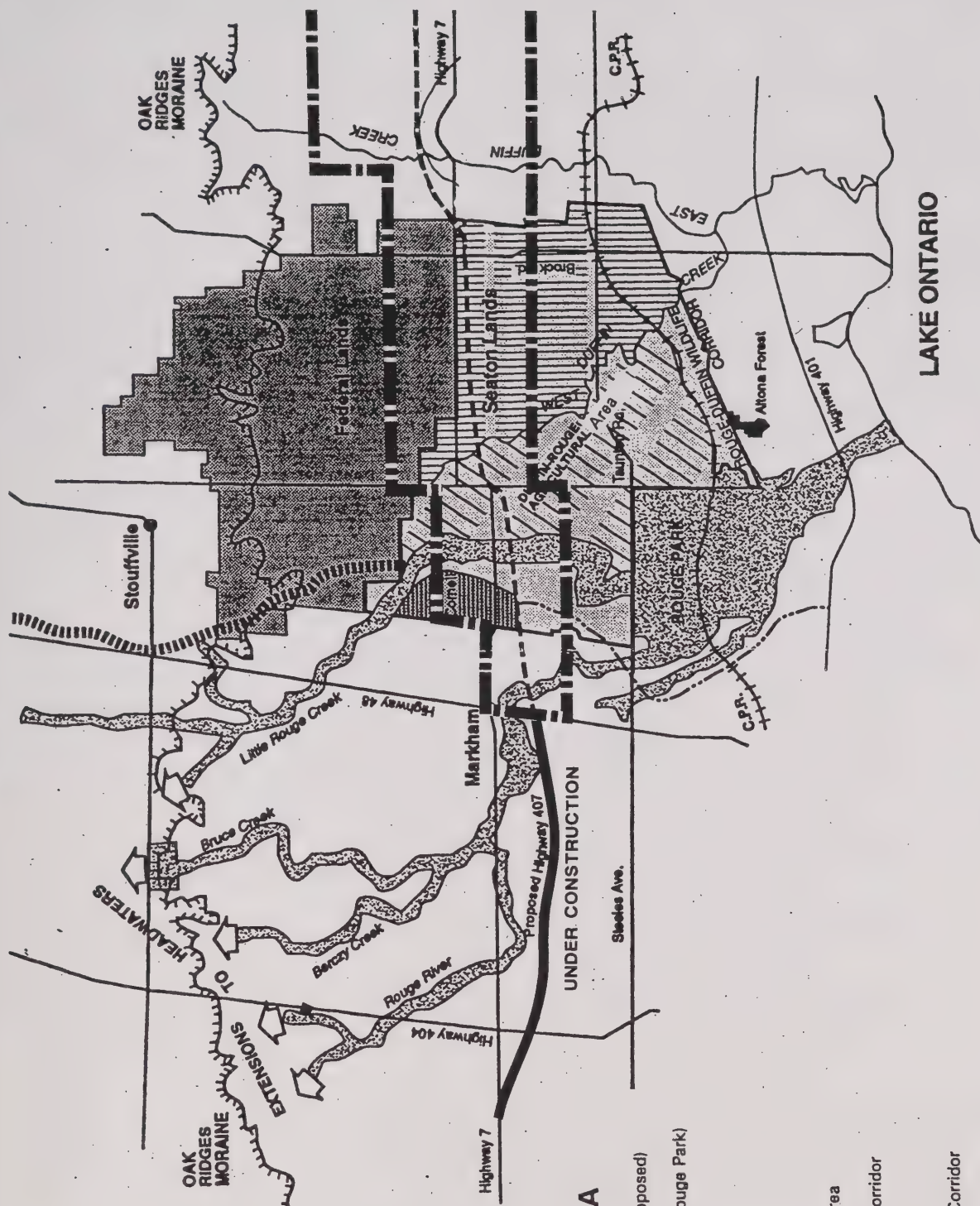
- land use designations and policies contained in Official Plans and associated documents made available by municipal technical representatives, including background papers and Secondary Plans; and
- available Official Plan Amendments, Plans of Subdivision, rezoning and site development applications. In terms of impact analysis, emphasis was placed on those sites for which at least planning approval had been received.

Specifically these include:

- Region of York Official Plan (June 26, 1995);
- Town of Markham Official Plan (Revised 1987) April 5, 1993;
- Town of Markham Official Plan Amendment No. 5 (Municipal Housing Statement Study/Urban Area Expansion Study) April 1995;
- Town of Markham Official Plan Amendment No. 81 (Rouge North Amendment) June 1988;
- Town of Markham Official Plan Amendment No. 25 (Rouge Northeast) February 1996;
- Town of Markham Official Plan Amendment and Secondary Plan - Cornell, July 1995;
- Town of Markham Subdivision Status Chart & Map, May 1996;
- Rouge Park Management Plan, May 1994;
- Region of Durham Official Plan, March 1996;

NORTH EAST GTA

- Rouge Park (Existing and Proposed)
- Extension to Headwaters (Rouge Park)
- Provincial Lands
- Seaton Lands
- Cornell Community
- Duffin-Rouge Agricultural Area
- Possible Little Rouge Park Corridor
- Oak Ridges Moraine Area
- Conceptual Transportation Corridor
- Study Area



HIGHWAY 407 / TRANSITWAY
MARKHAM ROAD EASTERLY TO
HIGHWAY 7 EAST OF BROCK ROAD

LAND USE INITIATIVES
IN NORTH EAST GTA

EXHIBIT
4.5.1

- Town of Pickering Official Plan, edition 13, 1989;
- Town of Pickering proposed Official Plan and relevant Discussion Papers, July 1996;
- Whitevale Heritage Conservation District - A Guide; and
- Major Rural Residential Proposals, January 1995

Subsequent to the main data collection exercise upon which the route assessment was based, there were substantive developments in these and other areas, including attempts at a co-ordinated policy and land use development strategy for areas of the Northeast Greater Toronto Area which would affect the western half of the Study Area such as:

- Initiation of a Seaton Structure Plan by the North Pickering Development Corporation; and
- The Pickering District Plan Review

Federal (Pickering Airport Site)

In 1973 and 1974 Public Works Canada (PWC) acquired 7,530 ha in the Town of Pickering for a new international airport. Within the study area, the Pickering Airport Site covers approximately 16 km² in Lots 17-35 Concession 6. With the exception of farms and residences which have been abandoned since acquisition, this area has retained its mid-1970's land use character, comprising primarily cash crop and hobby farm agricultural operations and rural residences.

In August 1992, approximately 2,060 ha of land were declared surplus, and in August 1993 Transport Canada prepared a conceptual land use plan and associated draft Initial Assessment (Environmental Assessment Review Process-EARP) report.

It was concluded that a new corporate/commuter airport should be given serious consideration on the Pickering airport lands. The National Airports Policy released in July 1994 defined a much narrower federal role in airports in which federal airports will be offered to provincial and local governments, etc. As a result, the conclusions outlined in the final report are offered as technical considerations, not recommendations, as input to the local decision making process. Durham's current Official Plan states that prior to the development of an airport on the Pickering lands, it will be necessary to identify any transportation system improvements that are required.

Highway 407 has the potential to provide improved (expressway) access to the proposed Pickering Airport Site, thus creating an external influence on the possible timing of this initiative, if the federal government decides that the airport is needed.

A highway facility route located in Concession 6 Pickering could be in direct conflict with airside elements of the airport site. In June 1990, Transport Canada provided comments in terms of both direct impacts to, and access to the Pickering Airport Site.

These included:

- i) A route in mid-concession 6 would conflict with current airport development proposals and is, therefore, not acceptable;
- ii) A route located in Concession 5, outside airport lands to the south, would likely require dedicated airport access, possibly through the introduction of an additional or specially designed interchange in the Brock Road area;
- iii) A route located a quarter-concession north of Highway 7 to the west of Brougham (on airport lands) is preferred from an airport development perspective but would also require dedicated access to the site.

Crombie Commission - Waterfront Regeneration Trust

In October 1989, the Province requested the federal government to expand the terms of reference for what was initially a federal Royal Commission on the future of the Toronto Waterfront to include the waterfront from Burlington to Newcastle and north to the Oak Ridges Moraine - the Toronto watershed. The Commission, with the Honourable David Crombie presiding, was provided with a mandate to:

"make recommendations regarding the future of the Toronto Waterfront, and to seek the concurrence of affected authorities in such recommendations, in order to ensure that, in the public interest, federal lands and jurisdiction serve to enhance the physical, environmental legislative and administrative context governing the use, enjoyment and development of the Toronto Waterfront and related lands."

The report, entitled "**Watershed**", released in August 1990, addressed the sensitivities and significance of the Oak Ridges Moraine. Moreover, it addressed more substantively an ecosystem approach and the direct linkages between the Moraine and Lake Ontario inherent in the major surface watercourse regimes in the Highway 407 study area that connect these two features.

The report's recommendations also include the call for further study of and a declaration of provincial interest in the Moraine as well as recognition of both the Moraine and the river valleys of the GTA as "Provincial Resources". Most important, the concept of connecting the waterfront, valley systems and the Moraine flows from the ecosystem approach outlined in the report.

Cornell

During 1989, the Town of Markham initiated the **East Markham Project** as a response to an expression of interest by the Province to have some of its lands in the Town considered for development (Lots 11-15 Con. 9). The study included the preparation of Official Plan Amendments, a Secondary Plan, rezonings and a Plan of Subdivision for the

area. The proposed community was also referred to as the Ninth Line Community and was renamed Cornell in spring 1994. The Secondary Plan for the Cornell Community was approved with modifications by the Ministry of Municipal Affairs in July 1995.

Approximately 625 hectares are designated for urban development in the Secondary Plan. The land in question is bounded by the Ninth Line, just north of Sixteenth Avenue, the Little Rouge Creek and the proposed Highway 407. The Cornell community is a mixed use development. The community will house an ultimate population of 27,300 and the projected number of dwelling units is up to 10,000 units.

Cornell is composed of six neighbourhoods, linked along a central boulevard that is also a major transit corridor. Within each of the neighbourhoods, there will be a wide range of housing choices built in the neo-traditional style, and ranging from cottages to single family units, semis, four-plex villas and apartments. A central core area is located between the existing Markham-Stouffville Hospital and Highway 7 and features a walking main street with shops, offices, restaurants and entertainment venues.

Seaton

The 2800 ha Seaton development proposes a mix of residential, commercial, industrial and recreational land uses on the east side of the West Duffins Creek. Within the development strategy, existing hamlets such as Whitevale and Green River would be preserved.

Urban Development of the Seaton lands has been approved in the Region of Durham and Town of Pickering Official Plans, and a Structure Plan for the community is under preparation in accordance with the local Official Plan. The Ontario Realty Corporation maintains ownership and manages the Seaton site, which remains largely in agricultural use.

Routing considerations should include the potential: to serve the community; to influence adjacent land use/population distribution; and to encroach on hamlet transition or buffer zones.

Rouge Valley Park

In March 1990, the Minister of Natural Resources announced that the Rouge River Valley area of the Greater Toronto Area would be protected through the establishment of a major urban park referred to as the Rouge Park. The Rouge Park Management Plan was released by the Province in May of 1994.

The 4,640 ha park area includes a block of land that stretches from Steeles Avenue south to Lake Ontario and from the west rim of the Rouge River valley into the Town of Pickering.

North of Steeles Avenue, the proposed park area includes the valleylands of the Rouge River and the Morningside, Berczy, Bruce and Little Rouge Creeks. In this area the ongoing acquisition of the valleylands will be guided by the Rouge watershed management strategy of the Metropolitan Toronto and Region Conservation Authority. The preparation of the Rouge Park North Management Plan is currently underway to define the proposed park boundary and appropriate management options. Interim protection measures in the valleylands will be implemented through co-operative planning with the municipalities and the conservation authority. This mandate includes identifying projects/developments with potential for downstream effects and maintaining park use flexibility by identifying concerns and formulating interim protection strategies.

The highway/transitway must cross the valleys currently under consideration for the extension of the Rouge Park north of Steeles Avenue and, therefore, must be sensitive to the objectives of the Rouge Park.

Duffin Rouge Agricultural Preserve

Within the Town of Pickering Official Plan, the 3,200 hectares west of Seaton between West Duffins Creek and the Markham-Pickering Town boundary comprised a special study area in which lands are to remain in agricultural use until their ultimate disposition has been determined. Agricultural use of these lands conforms to the original concept plan for the North Pickering community which proposed that the Provincial lands between the West Duffins Creek (north of the CPR line, north of Finch Avenue) in Pickering, and the Little Rouge River in Markham, should become an agricultural reserve, with some open space uses and include the existing hamlets. In 1993, the Duffin-Rouge Agricultural Preserve was implemented for this area.

In 1995 the Ontario Government announced its intention to dispose of its holdings in this area. However, the local Official Plans continue to recognize the area as agriculture.

Significance and Sensitivity

The land use developments in the study area have been an ongoing factor in the planning of the Highway 407/Transitway Transportation Corridor. The valley corridors under consideration for the extension of the Rouge Park are sensitive to any crossing of a transportation corridor. Since these valley systems are oriented in a north-south directions they cannot be avoided. However, the protection of ecosystem function and natural area linkages should be considered during the planning and design phases. Close liaison should be maintained with the planning teams for the various federal, provincial and municipal land use initiatives. Bridges should be used when crossing the Rouge River and the Little Rouge Creek to minimize adverse effects on the proposed Rouge Park. During the design and construction phase, ongoing discussion should be held with the MNR, MTRC and Rouge Park Alliance to ensure that recreational aspects are considered. Route locations should minimize impacts to the Duffin-Rouge Agricultural Area.

4.6 CULTURAL ENVIRONMENT

The assessment of components related to the cultural environment in the study area included the built environment features, the cultural landscape, and known and potential archaeological resources. The following section discuss these three cultural features.

4.6.1 Historical Resources

The assessment of built heritage features was prepared by Unterman McPhail Cumming Associates, specialists in the field.

The historical resource assessment was carried out in accordance with the requirements described in guidelines published by the provincial government ("Environmental Reference Book: Volume 4B Historical Resources", MTO Environmental Office, February 1989).

The inventory of features included:

- 19th century buildings and farmsteads
- 19th century schoolhouses
- 19th century churches
- cemeteries
- Ontario Heritage Act designated buildings
- Ontario Heritage Foundation easements
- museums/historic sites
- heritage highway and road bridges

The study area corridor with its rolling landform was not extensively settled until the 1820 period. Although some immigrants arrived earlier, especially in Markham Township, the second wave of immigrants, the Irish and Scottish, arrived from 1820 onwards. Mixed subsistence farming and grain export through the 1840s and 1850s contributed to a thriving economy. This was a period which coincided with the building of larger, more substantial farmhouses and agricultural facilities throughout the study area. They replaced the early log structures and shanties.

The main communities which grew through the 19th century included Locust Hill, Whitevale, Green River, and Brougham. Other smaller centres maintained stable populations, but experienced limited growth and on some occasions declined.

The types of built heritage features found in the study area are varied. They include: individual residences; barns; outbuildings; farmsteads; churches and schools; commercial structures; bridges; and, cemeteries and burial markers. There is a range of architectural styles and influences as well as types of building materials found (frame, brick and stone) in the study area.

The distribution of significant or special interest built heritage features in the study area is relatively random and extensive, with 19th century buildings and farmsteads being the predominant feature.

Built features and communities have been identified by the Town of Markham. The communities include Box Grove and Locust Hill. Other individual built features were identified in the study area. The Town of Markham has actively added to the original list of residential features, but have not included agricultural structures in their inventory. One property designated under Part IV of the Ontario Heritage Act at 53 Main Street South is in the study area. The Town of Markham listed 54 other buildings within the study area for historical and/or architectural significance.

In the portion of the study area within the Town of Pickering, the communities of Whitevale, Green River and Brougham were identified as sensitive to the introduction of a new or upgraded highway. Each community contains collections of early residential and other built features. The Hamlet of Whitevale is actively pursuing the designation of the community as a Heritage Conservation District, under Part IV of the Ontario Heritage Act.

The Federal Department of Public Works and Government Services (PWGSC) evaluated properties known as numbers 094, 284 and 208 in the study area (Pickering Airport Site) under the Federal Heritage Buildings Review Policy. They were not deemed to be significant by PWGSC.

Due to the wide dispersion of built features of significance or special interest, the potential for incurring effects on some features (displacement, proximity effects) was considered moderate to high.

Significance and Sensitivity

There are few built features which have been designated under Ontario Heritage Act. These features are situated within existing settlement areas (Markham and Whitevale) which should be avoided by the new highway/transitway facility. A detailed historical and architectural analysis of heritage resources found in the right-of-way of the Technically Preferred Route should be carried out in preparation for the design phase. **Note: At the time of writing of this EA these detailed studies were already underway.**

4.6.2 Cultural Landscape

The cultural landscape assessment was prepared by Unterman McPhail Cumming Associates.

For the purposes of an environmental assessment, cultural landscapes have been defined as the use and physical appearance of the land seen today as the result of human activities in modifying pristine landscapes for particular purposes. Cultural landscapes are aggregations of individual features, both natural or man-made or modified, that usually form discrete areas of homogeneous character such as a streetscape, village and rural land.

The two principal landscape types within the study area are villages or hamlets and rural land. The primary character of the study corridor is rural, exhibiting the following principal cultural landscape characteristics:

- undulating agricultural lands comprising farmsteads, fields, woodlots, fences and treelines;
- a number of north-south river valleys, heavily treed in some areas;
- individual farmsteads featuring simple farmhouses of masonry or frame construction (with barns) generally oriented to the east-west concession roads and some later nineteenth century and twentieth century buildings fronting on to the north-south sideroads;
- a predominant system of east-west Concession roads that cross a succession of shallow valleys with Highway 7 being an important historical route;
- an incomplete system of north-south sideroads that parallel the variety of creek tributaries and Brock Road, Pickering, as an important historical route;
- areas of strip development circa 1950s-60s;
- several substantial hamlets and villages comprising a variety of buildings, many of distinctive architectural merit.

Significance and Sensitivity

Apart from the villages that are of sufficient historical and architectural merit to warrant avoidance by various alignments, there appear to be no rural landscapes of sufficient scenic significance to merit avoidance.

4.6.3 Archaeological Resources

The Museum of Indian Archaeology, an affiliate of the University of Western Ontario in London compiled the background research on archaeological resources.

Approximately 50% of the known archaeological sites in the study area are based on reports of the discovery of artifacts by landowners and/or local informants; a majority of these sites have not been verified and/or investigated by professional archaeologists and the data on these sites are considered provisional and incomplete. The remaining sites known in the study area were discovered through archaeological survey by archaeologists, and data for these sites are considered reliable.

Appendix 6 presents a list of all known archaeological sites in the study area, with a statement on the nature and significance of each of those sites. This list is ordered alphabetically/numerically by Site Registration Code, from east to west across the study area.

Twenty-five (68%) of the identified sites have been assessed as being significant. Eleven of these are village, burial or ossuary sites which should be avoided or salvaged by archaeological excavation.

Areas of archaeological potential can be identified using the following accepted assumptions:

- all areas falling within 250 to 300 m of a source of water have archaeological potential;

- areas of well-drained soils on knolls, ridges, plateaus, terraces, etc. within that 250 to 300 m wide zone around water sources have a high archaeological potential;
- in south-central Ontario, abandoned Iroquoian fields have been regenerated with stands of pine, especially white pine, rather than with the more natural oak-maple-beech. Thus, large stands of pine, which were recorded by late-eighteenth to early nineteenth century surveyors, are indicative of former Iroquoian fields. Accordingly, these pine stands can be used to predict that an Iroquoian village site would be located somewhere in the immediate vicinity;
- in parts of Southern Ontario, it has been documented that a wide variety of special purpose sites were associated with Iroquoian villages; these special purpose sites include resource exploitation camps (i.e. hunting and fishing camps), agricultural cabin sites, hamlets, satellite villages, and burials. It has also been demonstrated that each village site had an associated "territory" that was extensively exploited and used by the village inhabitants for their daily, seasonal, and yearly needs, resulting in such special purpose sites. These special purpose sites normally occur within a 4 km radius of a village (Pearce 1984). Consequently, it can be predicted that if the location of an Iroquoian village is known, there is a high probability that there will be several special purpose sites within a 4 km radius of it. Conversely, if the location of a special purpose Iroquoian site is known, there is a high probability that there will be an Iroquoian village within a 4 km radius of it.

Significance and Sensitivity

The study area contains a relatively large number of registered archaeological sites known to be significant enough to warrant avoidance. There would appear to be significant potential for discovery of additional archaeological resources in unsurveyed portions of the study area based on the number of streams and other natural water sources occurring and the extensive nature of historical pine stands in the area.

At least two Iroquoian village sites at the eastern limits of the study area are known to be situated within an historically recorded pine stand; these are the Webb I (A1Gs-78) and Webb II (A1Gs-73) sites (Finlayson and Poulton 1979). Other known historical pine stands, indicative of potential adjacent Iroquoian village sites, are most extensive in proximity to the West Duffins Creek valley in Concession 5 Pickering.

At least four sites in the study area are known to contain human burials. If avoidance of these sites is not possible, it would be necessary to immediately initiate a consultation process involving the proponent of the undertaking, the Cemeteries Branch, Ministry of Consumer and Commercial Relations, the nearest Native Band Council, and an archaeological consultant.

All areas of archaeological potential associated with the Technically Preferred Route will require an archaeological survey prior to design and construction. **Note: At the time of writing of this EA, detailed archaeological surveys were already underway.**

4.7 Transportation and Engineering

4.7.1 Transportation Network and Traffic Service

For the purposes of the transportation analysis, a broad transportation study area was defined. This study area covered an area bounded by McCowan Road, Elgin Mills Road, Lake Ontario and east of Brock Road. The assessment was carried out to establish the role of Highway 407 and its effect in the context of the overall urban environment. Chapter 2 discusses the transportation condition in detail.

The affected roads fall under the jurisdiction of: the Ministry of Transportation; Region of Durham; Region of York; Metropolitan Toronto; City of Scarborough; Town of Pickering; Town of Ajax; and Town of Markham. These Provincial highways, Regional roads and Town arterial roads together form a hierarchical grid system of roads.

MTO data sources were reviewed and the following agencies contacted by letter to establish existing and proposed infrastructures, within the Extended Study Area:

- Region of Durham and the Towns of Pickering, and Ajax
- Region of York and the Town of Markham
- Metropolitan Toronto
- City of Scarborough
- C.P. Rail
- GO Transit
- Local Transit

The following Federal, Provincial and Municipal Transit agencies were contacted by letter to determine present and future levels of transit services which will be provided within the transportation study area.

- | | |
|-------------------|---------------------|
| • VIA Rail | • Pickering Transit |
| • GO Transit | • Ajax Transit |
| • Intercity Bus | • Whitby Transit |
| • Markham Transit | • Oshawa Transit |

Significance and Sensitivity

The capacity of the existing transportation network and its ability to meet future transportation demands is key to the problem definition and assessment of alternatives for addressing transportation deficiencies.

4.7.2 Utilities

The following utility companies and Municipal Agencies were contacted by letter to determine the location of their existing plant and any proposed expansion or improvement plans:

Ontario Hydro	Consumers Gas
Markham Hydro	Bell Canada (Metro Toronto & City of Oshawa)
Pickering Hydro	CNCP Telecommunications
Ajax Hydro	Region of York & Town of Markham
Region of Durham & Town of Pickering	Interprovincial Pipelines
TransCanada Pipelines	C.P. Rail

The following is a summary of information obtained from those contacted above.

Ontario Hydro

Within the study area, Ontario Hydro has one established transmission tower corridor which is sensitive to any new route proposals in terms of possible tower relocations, vertical clearance complications, power interruptions and associated costs. The corridor, which crosses the southwest corner of the study area in a southeasterly direction, contains a 500 KV line and has provisions for three 500 KV and two 230 KV power transmission lines.

Municipal Hydro

Only minor local service installations are found in the study area and parallel existing roadways on overhead lines

Interprovincial and TransCanada Pipelines

Neither Interprovincial Pipelines nor TransCanada Pipelines have pipelines within the study area.

Consumers Gas

There was one established and one proposed north/ south natural gas corridors of note through the study area. In the western portion of the study area, a 16 inch gas main lies within the Ninth Line right-of-way in the Town of Markham.

Bell Canada and CNCP Telecommunications

Existing telephone service lines are generally parallel with existing roadways and are on overhead lines, on common poles with local hydro services, and within some underground installations. Bell Canada (Toronto) has a major conduit in the study area along Highway 48, 3 square feet in size and carrying 16 ducts. Bell Canada (Oshawa) has established

Digital Multiplex switching equipment (DMS.1.U) on Brock Road south of Brougham. CNCP Telecommunications have proposed an installation of a buried fibre optic cable along the CP Rail Havelock Subdivision.

Regional and Municipal Services

Information provided from the affected jurisdictions have indicated a few major services, however the established local services in the area for the most part follow existing roadways and do not have significant design implications. In the Region of York, a 48 inch major storm sewer on the west side of Ninth Line drains from Highway 7 into a deep open ditch section, which eventually empties south of the study area into the Rouge River System. In addition, an existing 96 inch sanitary sewer passes diagonally across the southwest corner of the study area.

In the Region of Durham, an extensive servicing plan has been developed for the proposed Seaton Community, which comprises of sanitary sewers ranging in size from 450 to 900 mm and a network of watermain ranging in size from 300 to 1050 mm. In addition, 5 water reservoir locations and 6 pumping station locations have also been proposed for this community.

CP Railways

The CPR Havelock Subdivision passes diagonally through the western portion of the study area in a northeasterly direction. The C.P. Rail Havelock Subdivision presently has 2 tracks diagonally crossing the corridor in the vicinity of Locust Hill.

Significance and Sensitivity

The existing transportation network and demand is key to the assessment of the need for the undertaking and the development of route alternatives. Existing and proposed utilities will need to be considered during the planning phase to minimize routing conflicts and relocation costs. The crossing of the C.P. Rail Havelock Subdivision may require authorization by the Canadian Transportation Agency which could trigger a screening under the Canadian Environmental Assessment Act. (See Chapter 6).

4.7.3 Geotechnical

A geotechnical assessment of the study area was conducted by Geocon Inc. The geotechnical assessment concentrated on:

- Geotechnical conditions of the study area including general comments on foundations;
- Geotechnical hazards which outlined marshland areas with high water tables, areas of major erosion along larger watercourses and landfill sites; and

- Aggregate resources including areas with granular deposits and sand and gravel resource areas. Also licensed pits and pits with cancelled licences were highlighted.

The geotechnical conditions along the route corridor were not specifically addressed in any publications. The information presented within this section was based primarily on the engineering interpretation of the probable geotechnical conditions within the identified geological landforms. The analysis of anticipated conditions was based largely on experience and on the knowledge of the geological processes leading to their formation. However, a portion of the work was supplemented by general information obtained from regional and site specific geotechnical engineering reports within the area.

During this phase of the project, air photo interpretation was used extensively to delineate and identify areas which may be comprised of marshy conditions with a high water table. In some instances it was possible to confirm these suspected conditions by visual inspection from the local roads.

Geotechnical Conditions

Geotechnical conditions within the route corridor are controlled primarily by those of the drumlinised till plain which covers most of the study area. Generally, geotechnical conditions within the till are favourable with soil conditions consisting of dense to very dense silty fine sands and sandy silts with occasional cobbles and boulders. Therefore, this stratum will provide a good founding medium for the majority of the highway structures and will present few embankment stability problems.

At locations outside of the till unit materials are generally granular in composition and will also likely provide favourable geotechnical conditions. In some areas, where higher anticipated water table exists may generate problems with the temporary stability of excavations.

Within this Study Area, few areas having poor foundation soils have been identified. One such area of note is in the vicinity of Sideline 24. In addition, there were 2 sites along the Little Rouge Creek which have erosion problems. Also, a total of 2 gravel pits, were noted. The locations of 2 landfill sites were identified during the hydrogeology/waste management portion of the overall study and have been described under Section 4.2.3.

Aggregate Resources

The Aggregate Resources Inventory Papers (ARIP), contain information on the quality and quantity of existing reserves within their particular study area. Based on that information, areas have been selected as primary, secondary or tertiary resource areas. Selected aggregate resource areas at the primary level represent areas in which a major resource is known to exist. Those selected at the secondary level are believed to contain significant amounts of sand and gravel but are not considered the "best" resource areas. Areas selected at the tertiary level are not considered

as important resource areas because of limited available resources and/or because of potential extractive difficulties.

Generally speaking, the aggregate resources within this portion of the study area are limited and have been largely exhausted. The study area is dominated by tertiary resources, with areas of Primary and Secondary Resources being located to the east of the study area.

Significance and Sensitivity

Unstable soils can create foundation problems for transportation facilities. As well areas of quality aggregates should be protected. However, given the relatively good geotechnical conditions of the study area and the lack of quality aggregate resources, neither the geotechnical conditions nor the presence of aggregate resources should form a constraint to the location of route alternatives.

4.8 SUMMARY OF ENVIRONMENTAL SIGNIFICANT ISSUES

Table 4.8.1 summarizes the environmental sensitivities and issues associated with the planning of Highway 407/Transitway. These have been developed as a result of the analysis and consultation carried out throughout this project.

FACTOR	SENSITIVITY/ISSUE	POTENTIALLY CONCERNED AGENCY/GROUP
NATURAL ENVIRONMENT		
Surface Water Quality and Quantity	<ul style="list-style-type: none"> Protection of quality of watercourses flowing between Oak Ridges Moraine and Lake Ontario Number, location and type of new watercourse crossings, particularly in headwater areas Navigation on Rouge River 	<ul style="list-style-type: none"> MOEE, MNR, MTRC DOE, DFO RPA
Hydrogeology	<ul style="list-style-type: none"> Long term effects on shallow well water quality Encroachment on potential groundwater upwelling areas (effects on coldwater stream baseflow) 	<ul style="list-style-type: none"> Property owners Municipalities MOEE • MNR DFO, DOE
Waste Management	<ul style="list-style-type: none"> Potential health risks, clean-up costs and other liabilities associated with encroachment on known and unknown waste sites 	<ul style="list-style-type: none"> Proponent (MTO or its agent) Adjacent residents MOEE
Fisheries	<ul style="list-style-type: none"> Crossing of deeply incised forested river valley having high quality existing and potential fisheries resources Potential displacement/alteration of existing and potential critical fish habitat Potential impacts to mature riparian vegetation Presence of significant (recreational, uncommon, rare, vulnerable or endangered) fish species Priority management (rehabilitation/enhancement) areas Potential impacts of contaminants associated with roadways 	<ul style="list-style-type: none"> DFO • DOE MNR MTRC Anglers Groups RPA

ABBREVIATIONS:

MOEE - Ministry of Environment and Energy
MTO - Ministry of Transportation of Ontario
MBS - Management Board Secretariat
OGTA - Office of the Greater Toronto Area
LACAC - Local Architectural Conservation Advisory Committee
DOE - Environment Canada

OMAFRA - Ontario Ministry of Agriculture, Food and Rural Affairs
MTRC - Metropolitan Toronto and Region Conservation
ORC - Ontario Realty Corporation
MCCR - Ministry of Consumer and Commercial Relations
RPA - Rouge Park Alliance

DFO - Department of Fisheries and Oceans
SRVS - Save the Rouge Valley System
MMA&H - Ministry of Municipal Affairs & Housing
MEDT - Ministry of Economic Development and Trade
MCzCR - Ministry of Citizenship and Culture

Highway 407/Transitway

Markham Road Easterly to Highway 7 East of Brock Road

Environmental Assessment Study

TABLE 4.8.1

SUMMARY OF IDENTIFIED ENVIRONMENTAL SENSITIVITIES AND ISSUES

FACTOR	SENSITIVITY/ISSUE	POTENTIALLY CONCERNED AGENCY/GROUP
Vegetation	<ul style="list-style-type: none"> • Encroachment on/proximity to Environmentally Sensitive Areas designated by MTRC • Interpretive value of Seaton Trail (re: vegetation elements) • Remnant woodlots in urban fringe areas • Wetland areas • Crossing of forested valley areas • Diverse forested areas south of Highway 7 associated with Iroquois Beach 	<ul style="list-style-type: none"> • MTRC • RPA • Naturalist groups (Environment Markham, SRVS, Pickering Naturalists) • MNR • ORC • DOE
Wildlife	<ul style="list-style-type: none"> • Corridor value/function of stream valley systems • ESA's with specific habitat value due to extent or diversity (Whitevale Corridor) • Large remnant woodlots which serve as habitat in urban fringe areas 	<ul style="list-style-type: none"> • MTRC • RPA • Naturalist groups (Environment Markham, SRVS, Pickering Naturalists) • MNR • ORC • DOE
Ecosystem Integrity	<ul style="list-style-type: none"> • Major linear valley corridors • Major upland habitats • Major wetland areas 	<ul style="list-style-type: none"> • MNR, MOEE, RPA • MTRC • DOE • Naturalist Groups

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FACTOR	SENSITIVITY/ISSUE	POTENTIALLY CONCERNED AGENCY/GROUP
AGRICULTURE		
Physical Resources	<ul style="list-style-type: none"> • Preservation of good agricultural land in compliance with intent of Foodland Preservation Policy Statement and municipal Official Plans 	<ul style="list-style-type: none"> • OMAFRA • Municipalities
Farm Operations and Facilities	<ul style="list-style-type: none"> • Large operations (80+ ha) • Capital intensive operations specializing in livestock (dairy, beef, hog, chicken, sheep) • Specialty crops operations (vegetable, fruit, nursery) 	<ul style="list-style-type: none"> • OMAFRA • Farm operators • Consumers
Area Operations	<ul style="list-style-type: none"> • Integrity of stable agricultural communities • Impacts to Duffin-Rouge Agricultural Preserve/Area • Retention of farm transportation routes 	<ul style="list-style-type: none"> • OMAFRA • Agricultural associations • Farm operators • Municipalities

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TABLE 4.8.1

FACTOR	SENSITIVITY/ISSUE	POTENTIALLY CONCERNED AGENCY/GROUP
SOCIAL ENVIRONMENT		
Communities	<ul style="list-style-type: none"> Avoidance of encroachment on existing or planned communities either within or outside incorporated settlement boundaries 	<ul style="list-style-type: none"> Municipalities Ratepayers associations Other community residents/users/visitors
Recreation	<ul style="list-style-type: none"> Compatibility with Conservation Authority plans Potential impacts to Little Rouge Creek and Seaton Hiking Trail General intrusive effects associated with valley crossings (passive recreation amenities) Encroachment on major public/private facilities outside settlement areas (golf courses, gun clubs) 	<ul style="list-style-type: none"> MTRC Regional Tourist Associations MNR, RPA ORC Owners/operators Users
Noise	<ul style="list-style-type: none"> Proximity to settlement areas (villages, hamlets, strip residential development) Residential areas in valley corridors and light traffic areas are particularly sensitive (West Duffins-Whitevale) Existing unprotected suburban areas close to previously designated corridor (Chatelaine Drive, Colonel Butler Drive) Compatibility with planned communities (Cornell, Seaton) 	<ul style="list-style-type: none"> MOEE Existing residents Future residents Other noise sensitive receivers

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FACTOR	SENSITIVITY/ISSUE	POTENTIALLY CONCERNED AGENCY/GROUP
ECONOMIC ENVIRONMENT		
Federal/Provincial/ Municipal/Private Land Use Development Strategies	<ul style="list-style-type: none"> Impacts to remaining golf course operations and potential for future access, and residential subdivision developments 	<ul style="list-style-type: none"> Town of Markham Minto Limited
	<ul style="list-style-type: none"> Encroachment on 64 ha Archdiocese of Toronto holding (Lots 7-8 Concession 9, Markham) and future opportunities to access Ninth Line. 	<ul style="list-style-type: none"> Town of Markham Archdiocese of Toronto
	<ul style="list-style-type: none"> Constraints/opportunities for designated settlement area expansion in the Hamlets of Box Grove, Locust Hill, Whitevale, Green River, and Brougham. 	<ul style="list-style-type: none"> Town of Markham Region of York Town of Pickering Region of Durham Settlement area residents
	<ul style="list-style-type: none"> Functional viability of land uses and road network in Cornell area (Lots 11-15 Concession 9) and other lands within the Town of Markham's Future Urban Area boundary. Development of Secondary Plan(s) for East Markham 	<ul style="list-style-type: none"> Town of Markham MMA&H

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Highway 407/Transitway

Markham Road Easterly to Highway 7 East of Brock Road

Environmental Assessment Study

TABLE 4.8.1

SUMMARY OF IDENTIFIED ENVIRONMENTAL SENSITIVITIES AND ISSUES

FACTOR	SENSITIVITY/ISSUE	POTENTIALLY CONCERNED AGENCY/GROUP
Federal/Provincial/ Municipal/Private Land Use Development Strategies (cont'd)	<ul style="list-style-type: none"> Conflict with major utility corridors 	<ul style="list-style-type: none"> Municipal Utility Companies CP Rail Systems Ontario Hydro Pipeline Companies Canadian Transportation Agency MOEE
	<ul style="list-style-type: none"> The relationship to the Seaton and Pickering Airport lands with respect to providing adequate levels of transportation service and modal interface opportunities as they relate to stimulating desired levels and mix of development 	<ul style="list-style-type: none"> MMA&H Transport Canada Town of Pickering
	<ul style="list-style-type: none"> Maintaining flexibility regarding possible development of Seaton lands west of West Duffins Creek 	<ul style="list-style-type: none"> MMA&H Town of Markham Town of Pickering
	<ul style="list-style-type: none"> Region of Durham policies regarding the implementation of Highway 407 in conjunction with a parkway/urban separator function. 	<ul style="list-style-type: none"> Region of Durham
	<ul style="list-style-type: none"> Potential effects on existing and proposed estate residential and subdivision developments and other land use proposals outside designated Hamlet and Cluster areas. Compatibility with land uses which have not already accounted for the possibility of the project (i.e. major open space and rural-agricultural areas) 	<ul style="list-style-type: none"> OMAFRA Regions of Durham & York Developers

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FACTOR	SENSITIVITY/ISSUE	POTENTIALLY CONCERNED AGENCY/GROUP
Federal/Provincial/ Municipal/Private Land Use Development Strategies (cont'd)	<ul style="list-style-type: none"> Recognition and updating of property ownership patterns relative to optimizing the use/flexibility within publicly owned lands and minimizing the number and extent private property impacts Determination of air transportation needs and property disposition status at Pickering Airport site by Transport Canada and Public Works & Government Services Canada Completion of Planning Community No. 8 (Seaton) Secondary Plan by Town of Pickering 	<ul style="list-style-type: none"> MBS/ORC Developers Area residents MTO Transport Canada Public Works & Government Services Town of Pickering Region of Durham Town of Pickering MMA&H Whitevale, Green River residents Pickering Rural Association
Non-Farm Commercial Activities	<ul style="list-style-type: none"> Loss of exposure to passing traffic by highway commercial outlets in existing provincial highway or regional arterial road corridors Direct displacement of businesses and employees and resultant loss of municipal business and realty tax revenue 	<ul style="list-style-type: none"> Owners/operators Municipalities MEDT Consumers

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TABLE 4.8.1

FACTOR	SENSITIVITY/ISSUE	POTENTIALLY CONCERNED AGENCY/GROUP
CULTURAL ENVIRONMENT		
Historical Resources	<ul style="list-style-type: none"> Two of nine built features designated under Ontario Heritage Act lie outside built-up areas which will generally be avoided by candidate routes (i.e. they are vulnerable) Displacement of/proximity to other significant or special interest built features 	<ul style="list-style-type: none"> Parks Canada MCzCR Owners Municipalities (LACAC) Historical societies
Cultural Landscape	<ul style="list-style-type: none"> Existing settlement areas 	<ul style="list-style-type: none"> MCzCR Area residents/travellers
Archaeological Resources	<ul style="list-style-type: none"> Twenty-five significant registered archaeological sites Extensive areas with high potential for archaeological resources (based on incidence of streams and other water sources) Large areas of historic pine stands and special use areas indicative of potential adjacent Iroquoian villages 	<ul style="list-style-type: none"> MCzCR MCCR First Nations Property owners

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FACTOR	SENSITIVITY/ISSUE	POTENTIALLY CONCERNED AGENCY/GROUP
TRANSPORTATION & ENGINEERING		
Geotechnical	<ul style="list-style-type: none"> Marshland areas in the vicinity of Sideline 24 Gravel Pit just east of Sideline 22 Area of major erosion along Little Rouge Creek and Rouge River 	<ul style="list-style-type: none"> MTO MNR MTRC
Rail	<ul style="list-style-type: none"> Crossing of CP Havelock Line must respect ultimate track requirements, clearance envelopes, corridor access 	<ul style="list-style-type: none"> CP Rail MTO Canadian Transportation Agency
Utilities	<ul style="list-style-type: none"> Impacts to local utility services such as hydro and bell 	<ul style="list-style-type: none"> Ontario Hydro Region of Durham Local Utility Agencies

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CHAPTER 5

ROUTE PLANNING ALTERNATIVES

5.0 ROUTE PLANNING ALTERNATIVES

5.1 INTRODUCTION

The Route Planning Study for Highway 407 east of Markham Road was carried out between 1989 and 1993. The study resulted in the identification of a technically preferred route for Highway 407 from Markham Road to Highway 35/115. This Chapter describes the approach used to develop, analyze and evaluate route alternatives. **Although the evaluation of alternative routes consisted of nine stages for each of the two study sections (Markham Road to the Whitby/Oshawa Boundary and Whitby/Oshawa Boundary to Highway 35/115), this Chapter only summarizes the six stages that are relevant to the determination of the route between Markham Road and Highway 7 east of Brock Road. The stages of evaluation of the Route Planning Study not addressed in this Chapter dealt with alternative links east of Greenwood. The decisions made at these Stages did not affect the route West of Greenwood.**

5.2 DESIGN CONSIDERATIONS AFFECTING ALTERNATIVE ROUTE GENERATION

5.2.1 Transportation Network

The need and justification for an expansion of the freeway network and transit service improvements to address the projected travel demand associated with Official Plan Maturity in York and Durham Regions have been explained in Chapters 2 and 3. Specifically, the analysis concluded that in order to handle traffic demands associated with Official Plan Maturity, the following transportation network improvements will be required within the study area:

- the ultimate extension of Highway 407 from Markham Road in the Town of Markham to Highways 35/115 in the Municipality of Clarington;
- an arterial grid system at 2 km spacing with interchange opportunities at Highway 401 and Highway 407;
- an immediate extension of Highway 407 east of Markham Road to address traffic problems associated with the proposed opening of Highway 407 to Markham Road; and
- provision of an east-west transit corridor along Highway 407 from Markham Road to just east of the Oshawa-Clarington corridor.

The desired locations for interchanges was based on the desire to :

- Maximize the use of the highway/transitway;
- Protect communities from traffic infiltration;
- Maximize access opportunities; and
- Provide efficient use of the existing roadway network.

Generally in an urban area this results in interchanges at all arterial roads being crossed. For this undertaking, interchanges are to be provided at the following locations:

1. Highway 48
2. Ninth Line
3. Tenth Line (subsequently replaced by the Markham Bypass as discussed below)
4. Durham-York Line (Regional Road 30)
5. Seaton West Arterial (North Road vicinity)
6. Seaton East Arterial (Sideline 24 vicinity)
7. Brock Road

Furthermore, a temporary connection at Highway 7 east of Brock Road is required.

Note: the two Seaton interchanges were assumed for planning purposes. Their location will be determined as part of the planning for the Seaton Community.

These interchange locations were reviewed and agreed upon by the Ministry of Transportation and by the technical staff of relevant municipal governments.

The average proposed interchange spacing was approximately 2.1 kilometres, thus providing good accessibility. Also, the spacing between each interchange will provide adequate weaving length between the interchanges. The interchanges between Highway 407 and arterial roads were assumed to be Parclo A-4 type where possible.

Subsequent to the initial route alternatives being developed in 1990, a decision was made to plan for an interchange with the proposed Markham Bypass which required the removal of the Tenth Line interchange due to their close proximity.

5.2.2 Functional Design Criteria

To develop route alternatives for detailed assessment, functional design criteria needed to be established. Although these criteria will be refined during the design phase they are sufficient to guide the route planning phase. The development of the route alternatives was based on the following functional design criteria:

- right-of-way width - 160m basic width including 60m for transit on the south side
- freeway design speed - 120 kph
- vertical alignment - 2 % maximum grade
- horizontal alignment - 2000m minimum radius curve for freeway, except at limited locations where 1500m was used due to constraints

In determining the optimum cross-section and right-of-way width for the undertaking, a detailed cross-sectional analysis was carried out. The freeway cross-sectional analysis considered standard road design elements such as lane widths, median and shoulder widths, guiderails and barriers,

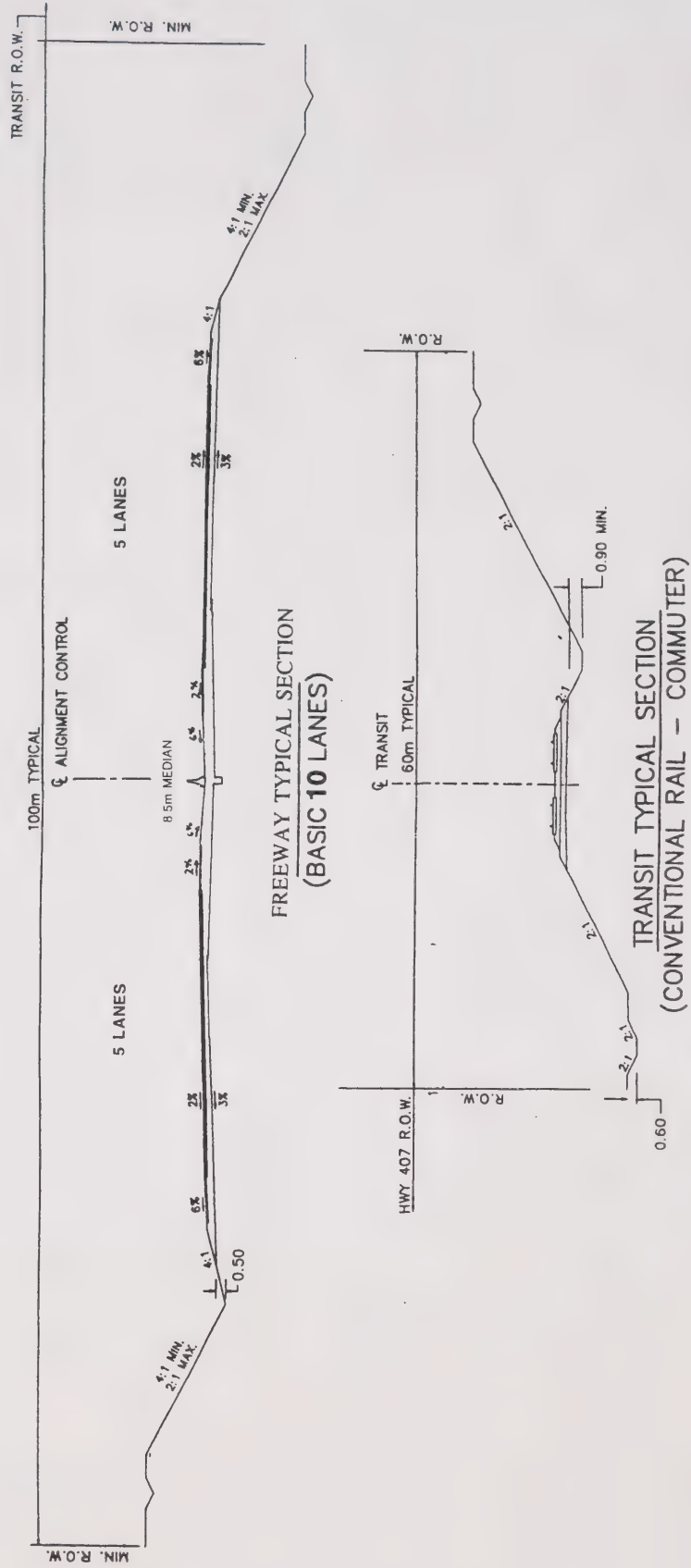
illumination, signage and advanced traffic management system (ATMS) requirements, in order to properly develop and select the most desirable freeway cross-section, and to determine the corresponding right-of-way required for its protection. Based on the findings of the assessment of future traffic needs, it was determined that the ultimate required freeway cross-section was basic 10 lanes with standard left/right shoulders and allowances for median highmast lighting poles.

Three types of standard "Freeway Only" cross-sections were considered: 7.5m urban median; 15.0m rural median; and 22.5m rural median. At the conclusion of the comparative analysis, it was recommended that the cross-section consisting of a 7.5 m median with continuous concrete barrier be selected as the ultimate freeway cross-section. Subsequent to the above recommendation being made, a decision was made to increase the minimum median width to 8.5 m for the portion of Highway 407 currently under construction west of Markham Road. This project will follow this recommendation.

For the "Freeway/Transit" cross-section, various transit technologies were considered. Engineering standards were researched for several transportation modes to establish the critical geometric design criteria and to determine the right-of-way requirements that maintain the most flexibility for transit technologies. In order to determine the critical lateral/vertical clearances and transit right-of-way requirements, an extensive cross-sectional investigation was undertaken for all alternative transit modes: at the transit stations; between transit stations; and through bridge sections. The critical geometric design criteria was found to be related to both the Freeway and Rail modes of travel.

The analysis of cross-section alternatives resulted in the adoption of a transit offset with a 8.5m freeway median as illustrated in Exhibit 5.2.1. This recommendation established the basic Freeway/Transit right-of-way corridor as 160m, with the transitway located on the south side of and adjacent to the land required for the highway facility. The reasons for this location are as follows:

- The Transitway, planned for the Highway 407 central corridor west of Markham Road, is located on the south side of the highway. This was due to property availability and geometric design limitations;
- For the remainder of the transitway east of Markham Road, situating it on the south side of the highway better serves the emerging planned urban development. In Durham Region this development is to the south of the corridor. Existing urban development and other property considerations do not impact the location of the transitway in this portion of the corridor; and
- Locating the transitway immediately adjacent to the highway right-of-way both reduces the amount of property required for the Highway 407/Transitway facility and any adverse impacts caused by the corridor.



HIGHWAY 407 / TRANSITWAY
MARKHAM ROAD EASTERLY TO
HIGHWAY 7 EAST OF BROCK ROAD

SCALE
N. T. S.

RECOMMENDED
FREEWAY/TRANSIT
CROSS-SECTION

EXHIBIT
5.2.1

5.3 APPROACH TO DEVELOPMENT, ANALYSIS AND EVALUATION OF ROUTE ALTERNATIVES

During the Data Collection phase of the Route Planning Study, as described in Chapter 4, constraints on route alignment possibilities were identified and assessed. Conceptual route alternatives which best avoided the constraints identified within the study area were then developed. Exhibit 5.3.1 presents the Composite Constraints Plan and the route alternatives that were generated. The initial route alignment alternatives were subsequently screened for technical feasibility and then further refined, prior to being reviewed during the first round of consultation.

Comments received during the first round of consultation were reviewed and incorporated into the next level of screening and refinement of the route alternatives. A subsequent detailed analysis and evaluation process led to the selection of a Technically Preferred Route. Input provided from a second round of external consultations was used for further assessment and refinement of the Technically Preferred Route.

5.3.1 The Evaluation Criteria

In order to assess the route alternatives, a set of Evaluation Criteria was developed through iterative consultation with study stakeholders. These Evaluation Criteria are presented in Appendix 1.

The Evaluation Criteria were consolidated within six major factor groups as follows:

- | | |
|-------------------------|-----------------------------------|
| 1. Natural Environment | 4. Agriculture |
| 2. Social Environment | 5. Cultural Environment |
| 3. Economic Environment | 6. Transportation and Engineering |

Within these groups, a total of 26 analysis/evaluation factors and 88 associated quantitative or qualitative indicators of potential condition changes (benefits and adverse impacts) were developed and cross-referenced with identified areas of concerns. Both short term and long term potential condition changes and resultant effects were considered. Inherent in the consideration of potential adverse impacts associated with project implementation is the significance of such impacts, the extent to which they may be mitigated and the resultant residual or net effects. The significance of effects related to their importance in local, regional or provincial contexts.

5.3.2 Analysis and Evaluation Process

The evaluation of route alternatives used a comprehensive comparative analysis and iterative evaluation. Although some preliminary evaluation of route alternatives occurred during the development of route alternatives, it occurred at a relatively coarse level of detail and is referred to as "screening" for the purposes of describing the planning process.

Appendix 7 provides a description of the methodology used by the Project Team with support from the Internal Team to evaluate route alternatives in order to identify the technically preferred route. Twelve alternative route segments were developed. These were paired for comparison purposes. A step-wise comparison of paired route alternatives was carried out using the 88 indicators.

It is emphasized that throughout the evaluation process, the numerical scoring/rating of alternatives was used primarily as a means of focusing on and enhancing a rational decision-making process and verifying selections made on the basis of best professional judgment.

5.4 ROUTE ALTERNATIVES

5.4.1 Environmental and Engineering Constraints

As mentioned in Section 5.3, major constraints were identified during the Data Collection Phase. These constraints, which influenced the development of the route alternatives are discussed below for each Factor Group; the constraints are discussed from west to east across the study area.

5.4.1.1 Natural Environment

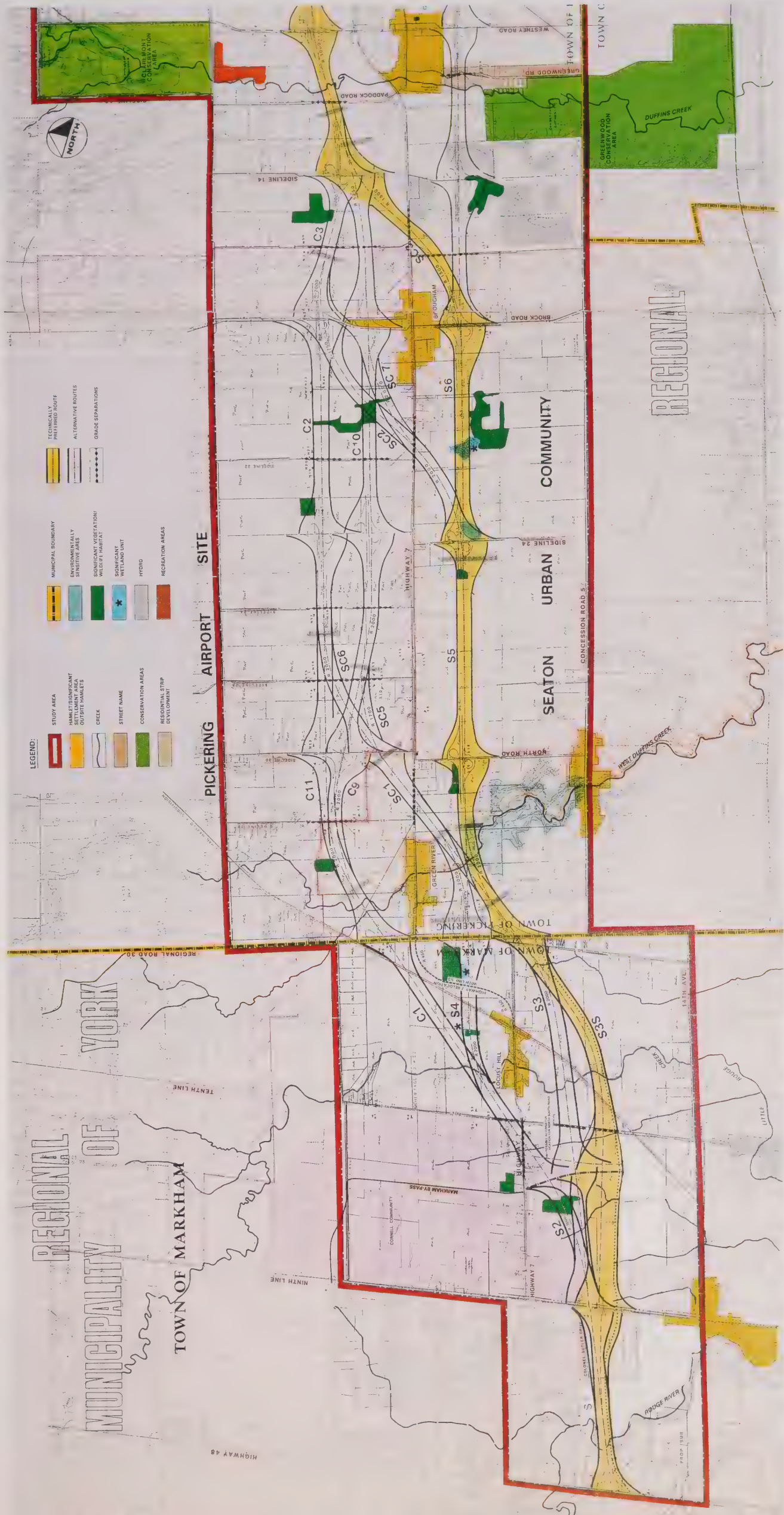
The following Natural Environment features influenced the development of the alignments for the route alternatives.

Environmentally Sensitive Areas (ESA's)

Route alternatives were developed to avoid encroaching on the Whitevale Corridor ESA.

Watercourses and Significant Fisheries Habitat

The three major watercourses traversing the study area in a north-south direction are the Rouge River, Little Rouge Creek and West Duffins Creek. Each of these watercourses has an associated linear open space corridor. It is a provincial objective to preserve these corridors. For the most part, other watercourses with significant fisheries resources, also run in a north-south direction traversing a significant portion of the study area. Since crossing these watercourses cannot be avoided, routes were developed to cross the watercourses at less sensitive locations where possible. The impact of the highway crossing the significant watercourses can, in many cases, be mitigated by spanning the watercourses with bridges. Petticoat Creek was also recognized as a constraint but imposed less significant limitations due to its location on the southern periphery of the study area.



HIGHWAY 407 / TRANSITWAY
MARKHAM ROAD EASTERLY TO
HIGHWAY 7 EAST OF BROCK ROAD

ROUTE LEGEND
ALTERNATIVES
TECHNICALLY PREFERRED ROUTE

SCALE



0 200 400 800 1200 m

COMPOSITE CONSTRAINT PLAN

EXHIBIT
5.3.1

Significant Vegetation/Wildlife Habitat and Significant Wetland Units

The significant woodlots and wetlands were avoided where possible. Other minor woodlots and wetlands did not form an absolute control in the development of the alternative routes.

5.4.1.2 Social Environment

The existing and planned developments within the towns of Markham and Pickering were considered as controls when developing route alternatives. As well, there are five Hamlets in the study area - Box Grove, Locust Hill, Green River, Whitevale, and Brougham. The future development boundaries for these communities, as given in the Region of York and the Region of Durham Official Plans, were considered as absolute controls not to be encroached upon. Existing cemeteries were also avoided.

5.4.1.3 Economic Environment

Non-farm commercial activities are concentrated in Hamlet and Village areas for the most part. Such uses outside established settlement areas are scattered, relatively small in size and comprise a range of commercial retail/service and wholesale enterprises. As such, these commercial activities did not form a constraint on the development of the routes.

There were three large tracts of land within the study area which, at the time of the Route Planning Study, were proposed for future development:

Cornell

The proposed Cornell development in east Markham was considered a significant constraint in developing the route alternatives, since incorporating the highway corridor within the community was not an option due to the character of the community and timing of the project. Route alternatives were developed to avoid significantly fragmenting or reducing the land available within the development.

Seaton

Due to the conceptual nature of the planning of the Seaton community at the time of route planning, it did not form a major control in developing the route alternatives. The conceptual community plan included sufficient flexibility to accommodate the route alternatives. Close liaison was maintained with the Seaton planning team to ensure compatibility between the Highway 407 planning and the Seaton plan.

Pickering Airport Lands

The Highway 407 study team acquired the preliminary runway layout for the proposed Pickering airport site from Transport Canada. Avoiding any conflict with the runway

layout was considered a significant control but initially was not considered to be an absolute control due to the uncertainty as to the ultimate development of this land. Subsequently, Transport Canada advised the Project Team that alternatives that significantly intruded on the airport lands were unacceptable because of Transport Canada's plans for these lands. Since the Province cannot force acceptance of an alternative through the federal lands by the Government of Canada, all alternatives dependent upon links through the federal lands were eliminated from further consideration.

5.4.1.4 Agriculture

In general, the study area is primarily in agricultural land use. The route alternatives were developed to minimize the impact on land holdings by running parallel with the concessions for the most part.

Although impacts to good agricultural land were an important consideration in the subsequent tradeoff analyses, the occurrence of Class 1 and 2 lands was not the major agricultural constraint in developing route alternatives. Rather, attention was directed towards the identification of large blocks of agricultural land and capital intensive operations, such as those specializing in livestock and specialty (vegetable, fruit, nursery) crops.

Locally Significant Agriculture Enterprises (LSAE's) were identified in all parts of the study area and were avoided where possible.

5.4.1.5 Cultural Environment

Cultural landscape, historical and archaeological resources were avoided where possible but were not considered to be absolute controls due to the potential for relocation or salvage.

5.4.1.6 Transportation and Engineering

The engineering constraints in the Study Area included, geotechnical conditions, utilities and the CP Rail Havelock line. Geotechnical hazards included marshland areas, areas of major erosion, gravel pits and landfill sites. With the exception of landfill sites, which were considered an absolute control, the geotechnical hazards were avoided where possible but were not an absolute control. Within the study area, utilities were not considered to be a control. The CP Rail line was considered a fixed control requiring grade separation between it and the highway/transitway.

With respect to laying out the route alternatives, the minimum desirable radius used was 2,000 m with a minimum radius of 1,500 m. The routes were designed to protect for an interchange or grade separation at the major crossroads. Local road relocations and undesirable interchange configurations were avoided where possible.

5.4.2 Development and Description of Route Location Alternatives

The development of one route only was possible between Markham Road and 9th Line. The single link (S1) connected with the approved section of Highway 407 west of Markham Road. No other route alternatives were possible through this section due to potential property impacts to existing residential development in the area and development commitments/proposals. The corridor runs eastward through the Markham Green Golf and Country Club (formerly the IBM Golf Course and approved for redevelopment as a residential subdivision) and remains south of the existing residential development along Colonel Butler Drive.

The study area east of 9th Line lent itself to division into sections for the purpose and development of route alternatives. The alternatives diverge or converge with one another at common points referred to as "nodes". The alternatives were selected to avoid the existing communities, minimize impacts to the Whitevale ESA, minimize encroachment on the Cornell development area, minimize disruption to plans for the airport and Seaton lands, minimize impacts to the north-south valley systems, and minimize impacts to residences and farm operations. Exhibit 5.4.1 shows the limits of each section. Appendix 8 provides an explanation of the rationale for selecting the route alternatives.

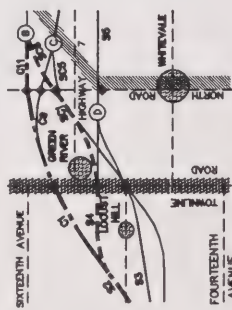
5.4.3 Detailed Analysis of Alternatives

Discrete portions of the route alternatives were identified as route segments by their intersection points, composed in turn of a series of route links. The alternative route segments were paired for purposes of comparative analysis and evaluation based on their common end points. Although during the Route Planning Study, alternatives were evaluated in nine stages, only the six stages that resulted in the identification of the technically preferred route between Markham Road and Highway 7 east of Brock Road are presented in this report. The potential impacts of each paired alternative segment with respect to each of the evaluation indicators were determined and are presented in tabular form in Appendices 9 to 15. The paired segments are summarized in Exhibit 5.4.1 "Key Plan to 9-Stage Evaluation". This section presents, for each paired comparison, a figure summarizing the comparison and the rationale for selecting the preferred alternative. The following subsections present the results of each of the paired comparisons.

CENTRAL SECTION

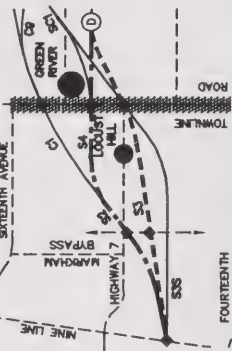


North of Green River vs South of Green River



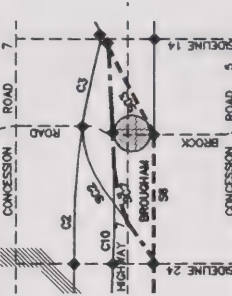
STAGE 2

North of Locust Hill vs South of Locust Hill



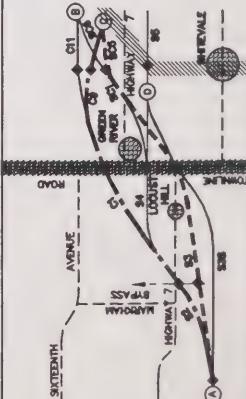
STAGE 3

STAGE 3



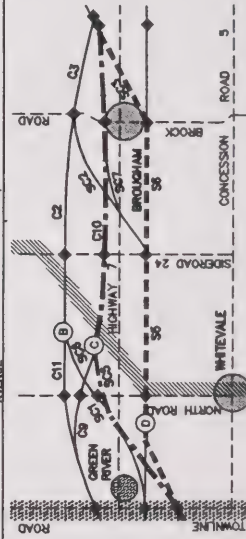
STAG 4 E

North of Locust Hill / Green River vs
South of Locust Hill / Green River



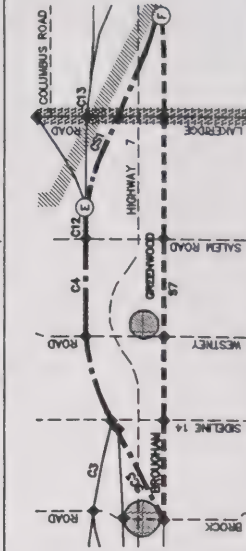
STAGE 5

Through Pickering Airport Site vs Through Seaton Community



STAGE 6

North of Greenwood vs South of Greenwood



12 ROUTE 1 BK

HIGHWAY 407 / TRANSITWAY
MARKHAM ROAD EASTERLY TO
HIGHWAY 7 EAST OF BROCK RD

KEY PLAN TO 8-STAGE EVALUATION

EXHIBIT

5.4.1

5.4.3.1 North of Green River (Links C1 + C11) vs South of Green River (Links S4 + S4/SC1 + SC1 + SC6) - Evaluated at Stage 1

A comparative analysis of the paired route segments north and south of Green River was carried out in Stage 1. For convenient quantification of the potential impacts of each alternative, please refer to the comparative analysis in Appendix 9. The comparison and rationale for selecting the alternative to be carried forward are summarized in Exhibit 5.4.2.

Natural Environment

Although the southern route affects more wooded area (12.2 vs 10.3 ha) and therefore more potential wildlife habitat, it is preferred overall from the natural environment perspective for the following reasons:

- it has fewer constraints on meeting MTO stormwater quality management objectives because there is less area of high water table affected;
- it affects fewer permanent coldwater streams and associated fish habitat; and
- it affects less headwater and groundwater recharge areas.

Social Environment

Essentially both the northern and southern routes are virtually identical with respect to Social Environment - crossing the West Duffins Creek, displacing approximately the same number of residences (8 vs 9), having similar impacts with respect to visual aesthetics, and impacting identical numbers of residences with noise increases of 5 dB to 20 dB. The southern route is slightly more desirable because:

- more of the properties affected are publicly owned;
- fewer residences will experience noise levels greater than 55 dB; and
- provides better buffering of Green River from the Seaton Community.

Economic Environment

Although the southern route displaces 1 business, it is preferred because it exhibits greater flexibility to provide regional access to Seaton.

Agriculture

The northern route impacts 7 farm operations while the southern only impacts 4. However, the southern route would displace 11 farm structures (including 4 residences) which would essentially result in the discontinuance of the existing operations. The northern route would not displace any structures. All operations affected are tenant occupied and, within the federal and Seaton areas, are designated for non-agricultural uses in future. Therefore, the two route segments were ranked equal with respect to this factor group.

Cultural Environment

The routes have similar impacts on significant historical and archaeological resources (5 built heritage features either within or adjacent to the right-of-way and 1 registered archaeological site within the right-of-way).

Transportation and Engineering

At the Durham-York Line interchange, the northern route would require difficult construction considerations as the interchange would be bounded by the CPR Havelock Subdivision and West Duffins Creek. The southern route segment provides greater directness of route.

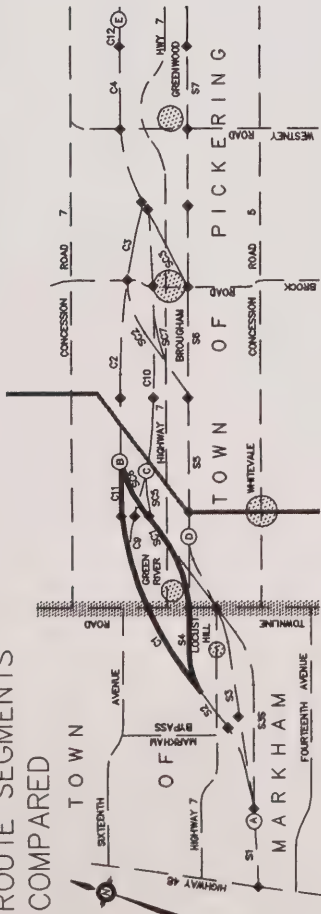
Summary

These segments were ranked relatively equal. However, the southern alternative (Segment S4 + S4/SC1 + SC1 + SC6) was carried forward because of greater potential to meet municipal, provincial and federal land use objectives for the Seaton and Pickering Airport initiatives, fewer social impacts on Green River and fewer constraints to meeting MTO stormwater quality management objectives. In addition, the mitigation of potential natural environmental effects to the West Duffins Creek valley will be addressed in the design of the bridge crossing.

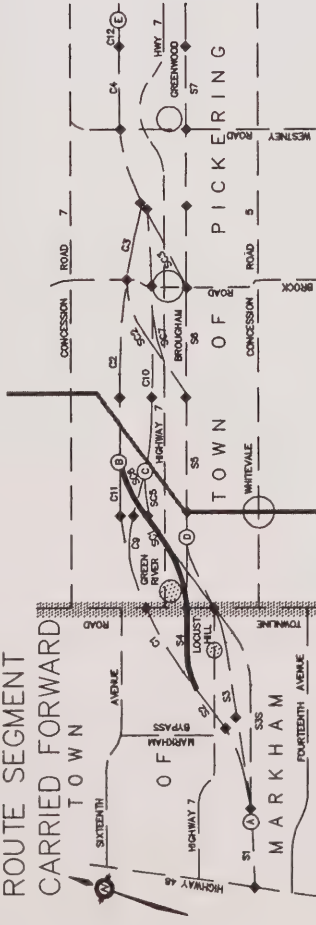
STAGE 1

NORTH OF GREEN RIVER vs SOUTH OF GREEN RIVER

ROUTE SEGMENTS COMPARED



ROUTE SEGMENT CARRIED FORWARD



RELATIVE CAPABILITY TO SATISFY EVALUATION CRITERIA	FACTOR						
	NATURAL	SOCIAL	ECO.	AGRICULT.	CULT.	TRANSP./ENG.	
SEGMENT							
NORTH OF GREEN RIVER (C1 + C11)	ECOSYSTEMS SURFACE WATER FISHERIES VEGETATION WILDLIFE HYDROLOGY WASTE MGMT.	COMMUNITIES RECREATION AESTHETICS NOISE	LAND USE NON-FARM COMM.	PHYSICAL RESOURCES FARM OPERATIONS AREA OPERATIONS	HISTORICAL ARCHAEOLOGICAL CULT. LANDSCAPE	NETWORK/SERVICE GEOTECHNICAL STAGING CONSTRUCTION CONSID.	
SOUTH OF GREEN RIVER (S4 + S4/SC1 + SC6)							
RELATIVE CAPABILITY TO SATISFY EVALUATION CRITERIA:							MOST EFFECTIVE

HIGHWAY 407 / TRANSITWAY
MARKHAM ROAD EASTERLY TO
HIGHWAY 7 EAST OF BROCK ROAD

LEGEND:

ROUTE SEGMENTS COMPARED		SUMMARY COMPARISON AND RATIONALE FOR SELECTION OF ROUTE SEGMENT CARRIED FORWARD
ROUTE SEGMENT CARRIED FORWARD	RELATIVE CAPABILITY OF ROUTE SEGMENTS TO SATISFY EVALUATION CRITERIA	

SUMMARY COMPARISON

SEGMENT FACTOR	NORTH OF GREEN RIVER (C1 + C11)	SOUTH OF GREEN RIVER (S4 + S4/SC1 + SC1 + SC6)
NATURAL ENVIRONMENT	<ul style="list-style-type: none">Requires realignment/channelization of West Duffin Creek tributaries.Cut section (270m) in identified upper aquifer (potential groundwater contamination, interference).104 ha recharge area encroachment.	<ul style="list-style-type: none">Greater impacts to high quality remnant woodlots and minor wetland area in east Markham.Proximity to north end of Metropolitan Toronto and Region Conservation Authority Whitevale Corridor ESA but valley spanned to maintain wildlife corridor (West Duffin Creek).More opportunities to meet stormwater quality objectives.86 ha recharge area encroachment.
SOCIAL ENVIRONMENT	<ul style="list-style-type: none">Avoids proximity effects to Section Trail recreational amenities.Displacement of 8 residences.Noise level over 55dBA for 8 residences.8 residences experience noise increases greater than 5dBA.	<ul style="list-style-type: none">Greater capability to meet objective of providing buffer between Hamlet of Green River and Section community.Proximity to Section Trail and other West Duffin Creek recreational amenities. Valley spanned to maintained linear open space connections.Displacement of 9 residences.Noise level over 55dBA for 3 residences.
ECONOMIC ENVIRONMENT	<ul style="list-style-type: none">Potential conflict with provincial/municipal land use objectives for Locust Hill, Green River and Section Community and federal initiatives for Pickering Airport Site.	<ul style="list-style-type: none">Greater flexibility to accommodate provincial and municipal land use objectives for Section community.Displacement of 1 business (8 employees).
AGRICULTURE	<ul style="list-style-type: none">Greater effects on capital intensive (livestock) operations.	<ul style="list-style-type: none">Affects fewer farm properties (4) but displaces more farm buildings (11). Primarily tenant occupied; less capital investment.
CULTURAL ENVIRONMENT	<ul style="list-style-type: none">1 heritage feature within right-of-way; 4 within 100m1 registered archaeological site within right-of-way.	<ul style="list-style-type: none">3 identified heritage structures within right-of-way; 2 within 100m.Some visual encroachment on grouping of heritage structures to the east of Highway 7 (cultural landscape impacts).1 archaeological site within right-of-way.
TRANSPORTATION & ENGINEERING	<ul style="list-style-type: none">Disadvantages of interchange at York Road 30 (Townline)<ul style="list-style-type: none">difficult and expensive construction due to proximity to CP Rail line and West Duffin Creektraffic operational problems (proximity to Hwy 7)requires high fill at West Duffin Creek valley crossing	<ul style="list-style-type: none">Better traffic/transit service, construction attributes.
SUMMARY RATIONALE These segments were ranked relatively equal. However, the southern alternative (Segment S4 + S4/SC1 + SC1 + SC6) was carried forward because of greater potential to meet municipal, provincial and federal land use objectives for the Section and Pickering Airport initiatives, fewer social impacts on Green River and fewer constraints to meeting MTO stormwater quality management objectives. In addition, the mitigation of potential natural environmental effects to the West Duffin Creek valley will be addressed in the design of the bridge crossing.		

STAGE 1 EVALUATION

EXHIBIT

5.4.2

5.4.3.2 North of Locust Hill (Links S2 + S4 + S4/SC1) vs South of Locust Hill (Links S3+ S3/SC1) - Evaluated at Stage 2

A comparative analysis of the paired route segments north and south of Locust Hill was carried out in Stage 2. The comparison included the potential effects of the relocation of Highway 7 between Locust Hill and Green River. For convenient quantification of the potential impacts of each alternative, please refer to the comparative analysis in Appendix 10. The comparison and rationale for selecting the alternative to be carried forward are summarized in Exhibit 5.4.3.

Natural Environment

Both routes have relatively the same effects with respect to watercourse crossings and fisheries. Although the southern route is closer to the Whitevale Corridor ESA, and has greater potential impacts in the Rouge River Watershed because of its proximity to the headwaters of the Petticoat Creek, it is preferred because:

- it has fewer impacts to high quality remnant woodlots and wetland areas in east Markham;
- it affects fewer hectares of recharge area, and headwater areas; and
- the southern crossings of the Little Rouge corridor in proximity to the existing rail corridor, and of the West Duffins corridor close to Green River, are preferred because they minimize the interval of urban interference with the valleys.

Social Environment

The southern route is preferred over the northern across all indicators, except with regards to visual impacts and the buffering of the Hamlet of Green River from Seaton, for which both routes are identical. The southern route is preferred because:

- it displaces fewer residences;
- fewer residences will experience noise increases between 5 dB and 20 dB;
- it leaves fewer residences exposed to noise levels of 55 dB or greater, post construction;
- more of the affected properties are already publicly owned; and
- fewer total properties are required.

Economic Environment

Both routes retain the flexibility to serve both the Pickering Airport lands and the Seaton Community. The northern route was considered less desirable because it would act as a constraint on proposed development of Cornell and would displace 2 businesses resulting in direct loss of 10 jobs.

Agriculture

Both routes are somewhat comparable in their impacts to farming operations. The southern route consumes approximately 14% more Class 1 and Class 2 agricultural land than the northern route. However, the northern route would displace more (10) farm buildings. Their loss would effectively displace one of the few privately owned operations in this section of the study area. Therefore, the southern route was considered marginally preferable for the agricultural component.

Cultural Environment

The routes are relatively similar with respect to significant historical and archaeological attributes within their right-of-way (3 and 2 built heritage features for northern and southern routes respectively; 1 archaeological site each).

Transportation and Engineering

The northern route is more curvilinear than the southern route; however, it has fewer interchange considerations. The northern route would require a modified non-standard interchange configuration at the Markham Bypass to accommodate a ramp at Highway 7. The southern route would necessitate a realignment of Highway 7 in the vicinity of the Durham-York Line, which would coincidentally improve the directness of route of Highway 7. Also the southern route would result in a skewed interchange configuration at the Durham-York Line. The southern route segment provides greater directness of route.

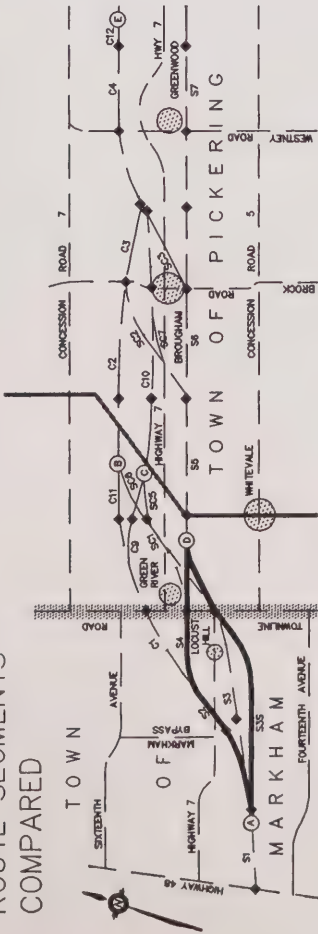
Summary

A high degree of consideration was given to preservation of high quality woodlot ecosystems in the Town of Markham and this favoured retention of Segment S3 + S3/SC1 (South of Locust Hill). Other major considerations included minimizing impacts to the pocket of privately owned properties in the Highway 7/Tenth Line area and compatibility with the proposed Cornell Community. Therefore the southern alternative was carried forward.

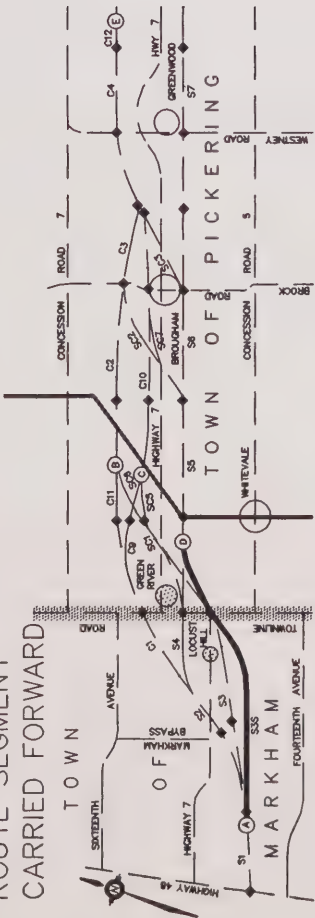
STAGE 2

NORTH OF LOCUST HILL vs SOUTH OF LOCUST HILL

ROUTE SEGMENTS COMPARED



ROUTE SEGMENT CARRIED FORWARD



RELATIVE CAPABILITY TO SATISFY EVALUATION CRITERIA	FACTOR						TRANSP./ENG. COST
	NATURAL	SOCIAL	ECO.	AGRICULT.	CULT.		
SEGMENT	ECOSYSTEMS SURFACE WATER FISHERIES VEGETATION WILDLIFE HYDROGEOLOGY WASTE MGMT.	COMMUNITIES RECREATION AESTHETICS NOISE	LAND USE NON-FARM COMM.	PHYSICAL RESOURCES FARM OPERATIONS AREA OPERATIONS	HISTORICAL ARCHAEOLOGICAL CULT. LANDSCAPE	NETWORK/SERVICE GEOTECHNICAL STAGING CONSTRUCTION CONSID.	
NORTH OF LOCUST HILL (S2 + S4 + S4/SC1)	●	●	●	●	●	●	
SOUTH OF LOCUST HILL (S3 + S3/SC1)	●	●	●	●	●	●	
RELATIVE CAPABILITY TO SATISFY EVALUATION CRITERIA:							● → MOST EFFECTIVE

SUMMARY COMPARISON

SEGMENT FACTOR	NORTH OF LOCUST HILL (S2 + S4 + S4/SC1)	SOUTH OF LOCUST HILL (S3 + S3/SC1)
NATURAL ENVIRONMENT	<ul style="list-style-type: none">Greater impacts to high quality remnant woodlots and wetlands areas in east Markham.7 wells within right-of-way influence zone.Encroachment on 31 ha of groundwater recharge area.	<ul style="list-style-type: none">Greater number of impacts in Rouge River watershed are related to influence on Petticoat Creek headwater area (warmwater stream).Proximity to north end of MTRCA Whitevale Corridor ESA but valley spanned to maintain wildlife corridor.Encroachment on 17 ha of groundwater recharge area.4 wells within right-of-way influence zone.
SOCIAL ENVIRONMENT	<ul style="list-style-type: none">Displacement of 11 residences including owner occupied homes in Highway 7/Tenth Line area.Greater number of residences experiencing significant noise increases (7) and noise levels over 55dBA (4).An increase of 5 decibels or more is considered significant. 55 decibels is the Provincial objective for outdoor recreational areas.	<ul style="list-style-type: none">Displacement of 4 residences, primarily tenant occupied.3 residences experience noise increase of 5dBA.Potential buffer between Locust Hill and future urban development to the south.
ECONOMIC ENVIRONMENT	<ul style="list-style-type: none">Imposes undesirable constraints on proposed East Markham (Cornell) Community development.Displacement of 2 businesses (10 employees).	<ul style="list-style-type: none">More compatible with East Markham (Cornell) Community development proposals.
AGRICULTURE	<ul style="list-style-type: none">Displaces more agricultural buildings (10) including privately owned.Creates greater fragmentation of operations and greater number of parcels less than 20 ha.	<ul style="list-style-type: none">Requires 14% more good agricultural land, 56% more farm property. Predominantly tenant occupied.
CULTURAL ENVIRONMENT	<ul style="list-style-type: none">3 heritage feature within right-of-way.1 registered archaeological site (Brown Site - isolated find spot; indeterminate site type) within right-of-way.1 registered archaeological site within 100 m of right-of-way.	<ul style="list-style-type: none">2 built heritage features within right-of-way.1 registered archaeological site (Ansell Site - 1 ha campsite) within right-of-way.
TRANSPORTATION & ENGINEERING	<ul style="list-style-type: none">Non-standard interchange required at Markham Bypass to accommodate existing Highway 7 (potential safety concern).Skew (55°) angle between Highway 407/Transit and possible directional interchange at Markham Bypass.	<ul style="list-style-type: none">Requires realignment of Highway 7 between Locust Hill and Green River.

SUMMARY RATIONALE A high degree of consideration was given to preservation of high quality woodlot ecosystems in the Town of Markham and this favoured retention of Segment S3 + S3/SC1 (south of Locust Hill). Other major considerations included minimizing impacts to the pocket of privately owned properties in the Highway 7/Tenth Line area and compatibility with the proposed East Markham (Cornell) Community.

HIGHWAY 407 / TRANSITWAY
MARKHAM ROAD EASTERLY TO
HIGHWAY 7 EAST OF BROCK ROAD

LEGEND:	
ROUTE SEGMENTS COMPARED	SUMMARY COMPARISON AND RATIONALE FOR SELECTION OF ROUTE SEGMENT CARRIED FORWARD
ROUTE SEGMENT CARRIED FORWARD	
RELATIVE CAPABILITY OF ROUTE SEGMENTS TO SATISFY EVALUATION CRITERIA	

STAGE 2 EVALUATION

EXHIBIT

5.4.3

5.4.3.3 North of Brougham (Link SC7) vs South of Brougham (Links S6 + SC3) - Evaluated at Stage 3

A comparative analysis of the paired route segments north and south of Brougham was carried out in Stage 3. For convenient quantification of the potential impacts of each alternative, please refer to the comparative analysis in Appendix 11. The comparison and rationale for selecting the alternative to be carried forward are summarized in Exhibit 5.4.4.

Natural Environment

The northern route segment is further removed from the local headwaters of the Duffins Creek tributaries and associated valleys. Consequentially, it has marginally fewer impacts on woodlots, wildlife habitat, recharge areas, and upwelling and seepage areas.

Social Environment

The southern route is preferred over the northern across all indicators because:

- it displaces significantly fewer residences;
- it impacts fewer residences with noise increases between 5 dB to 20 dB;
- it leaves fewer residences exposed to noise levels of 55 dB or greater, post construction;
- fewer total properties are required.
- it offers less negative visual impact along Brock Road;
- it satisfies a provincial land use objective of buffering the hamlet of Brougham from the Seaton Community.

The northern route is better because:

- slightly more of the properties affected are publicly owned;

Economic Environment

The southern route was more compatible with the Region of Durham OP by maintaining the transportation corridor within Concession 5 through Seaton as opposed to directing the corridor through the Pickering Airport lands. The northern route was more compatible with the Town of Pickering's objectives of providing a buffer between Brougham and the proposed Pickering Airport. The southern route meets a provincial objective of buffering the community of Brougham from Seaton, and is less restrictive in terms of limiting design flexibility in future airport planning exercises. Based on the foregoing considerations, the southern option is preferred.

Agriculture

The routes are generally comparable with respect to agricultural impacts. The northern route was less desirable because it would jeopardize the viability of a large specialty crop operation.

Cultural Environment

The northern right-of-way contains 4 historically significant residences in the Hamlet of Brougham which are important for their group value in this historical settlement. Both have one registered archaeological site within their right-of-way but the one on the northern route segment is the greatest concern because it is an Iroquoian Village. Therefore, the southern route is preferred.

Transportation and Engineering

While the southern route is much less curvilinear than the northern, it has comparatively more desirable geometrics and geotechnical conditions. The southern route, by virtue of its being closer to well established trip generators south of the study corridor, provides a more direct access to the proposed transportation facility from both a road and transit perspective. A southern route would not force highway-seeking traffic through the hamlet of Brougham and would also allow for a more convenient interface with transit services from the south.

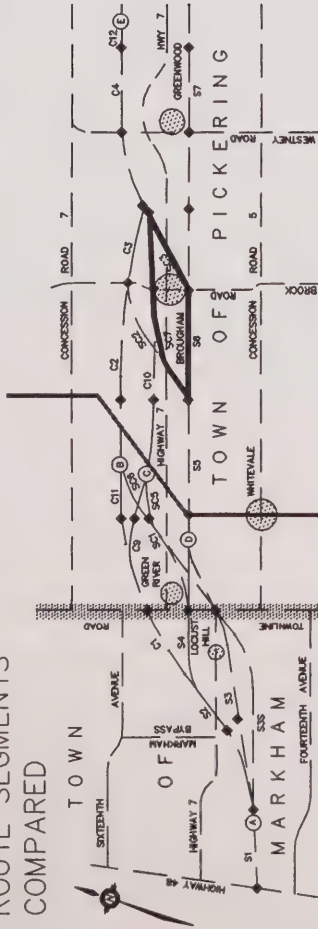
Summary

Segment S6 + SC3 (South of Brougham) was carried forward based on a greater capability to meet municipal, provincial and federal development objectives and comparatively fewer social and cultural impacts. Minimizing potential impacts to a nursery operation was also a significant consideration.

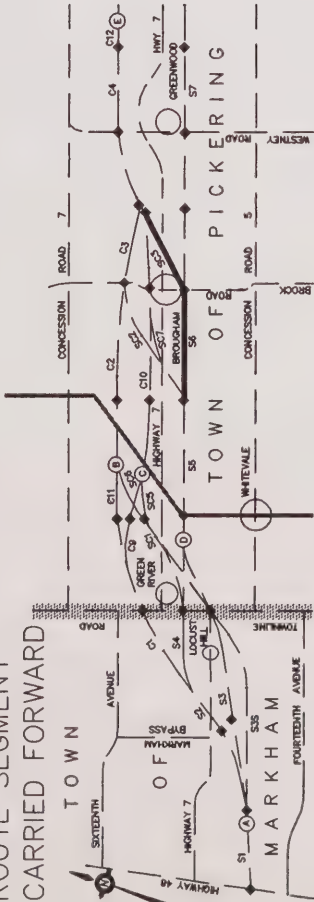
STAGE 3

NORTH OF BROUGHAM vs SOUTH OF BROUGHAM

ROUTE SEGMENTS COMPARED



ROUTE SEGMENT CARRIED FORWARD



RELATIVE CAPABILITY TO SATISFY EVALUATION CRITERIA	FACTOR						
	NATURAL	SOCIAL	ECO.	AGRICULT.	CULT.	TRANSP./ENG.	
SEGMENT	Ecosystems Surface Water Fishes Vegetation Wildlife Hydrogeology Waste Mgmt.	Communities Recreation Aesthetics Noise	Land Use Non-Farm Comm.	Physical Resources Farm Operations Area Operations	Historical Archaeological Cult. Landscape	Network/Service Geotechnical Staging Construction Consid.	
NORTH OF BROUGHAM (SC7)	●	●	●	●	●	●	●
SOUTH OF BROUGHAM (S6 + SC3)	●	●	●	●	●	●	●
RELATIVE CAPABILITY TO SATISFY EVALUATION CRITERIA:							● → MOST EFFECTIVE

SUMMARY COMPARISON

SEGMENT	NORTH OF BROUGHAM (SC7)	SOUTH OF BROUGHAM (S6 + SC3)
FACTOR		
NATURAL ENVIRONMENT	<ul style="list-style-type: none">Further removed from Duffin Creek tributary valleys and sensitive vegetation units (50% less forested area displaced).More wells (7) within right-of-way influence zone.6 ha habitat displaced.	<ul style="list-style-type: none">Marginally less desirable due to proximity to Duffin Creek ecosystem components (coldwater tributaries, wetland/lowland forest habitat, groundwater upwelling areas).3 wells within right-of-way influence zone.19 ha habitat displaced.
SOCIAL ENVIRONMENT	<ul style="list-style-type: none">Encroachment on northern part of Brougham.Displaces 18 residences.Significant noise increase for 15 residences.Potential to draw traffic through Brougham if no Brock Road bypass is implemented.	<ul style="list-style-type: none">Displaces 11 residences.Significant noise increases for 2 residences.
ECONOMIC ENVIRONMENT	<ul style="list-style-type: none">Only partially compatible with Duram Draft O.P. but is compatible with Town of Pickering general land use objectives (buffers Brougham from Airport).Incompatible with Town of Pickering development plan for Brougham.Less compatible with Seaton access objectives.Potential conflict with Pickering Airport site land uses.	<ul style="list-style-type: none">Compatible with Durham Draft O.P. and partially compatible with Pickering land use objectives for Brougham.Meets provincial objective of providing buffer between Brougham and Seaton Community.Does not conflict with federal Pickering Airport initiative and still exhibits flexibility to provide dedicated access to Airport site.More compatible with/provides better service to Seaton lands.
AGRICULTURE	<ul style="list-style-type: none">Jeopardize viability of largest specialty crop operation in study area (Nursery). Severance; requires 6.4 ha (15%) of parcel.	<ul style="list-style-type: none">Less extensive impacts to Nursery operation (limited to southeast corner).
CULTURAL ENVIRONMENT	<ul style="list-style-type: none">4 historical features in Brougham are within right-of-way (group value; historical settlement).Impacts to historical settlement of Brougham and moderately sensitive rural/agricultural landscape.Significant archaeological site (Peter Webb Site II-Iroquoian Village) within right-of-way.	<ul style="list-style-type: none">5 historical features within right-of-way.1 registered archaeological site (Salgo Site - Archaic campsite) within right-of-way.
TRANSPORTATION & ENGINEERING	<ul style="list-style-type: none">Significant length (2.8km) of facility has maximum acceptable longitudinal grade (2.2%).	<ul style="list-style-type: none">More desirable longitudinal grades (none in excess of 1.1%).Sideline 14 interchange located on 1500 m curve; skew (55°) angle with Highway 407/Transitway.
SUMMARY RATIONALE		
Segment S6 + SC3 (South of Brougham) was carried forward based on a greater capability to meet municipal, provincial and federal development objectives and comparatively fewer social and cultural impacts. Minimizing potential impacts to the Dutchmaster Nursery was also a significant consideration. Potential impacts to Duffin Creek tributaries will be mitigated to some degree by introducing bridge crossings instead of culverts.		

5.4.3.4 North of Locust Hill/Green River (Links S2 + C1 + C9) vs South of Locust Hill/ Green River (Links S3 + S3/SC1 + SC1 + SC5) - Evaluated at Stage 4

A comparative analysis of the two route segments north and south of Locust Hill and Green River was carried out in Stage 4. For convenient quantification of the potential impacts of each alternative, please refer to the comparative analysis in Appendix 12. The comparison and rationale for selecting the alternative to be carried forward are summarized in Exhibit 5.4.5. The southern alternative includes the realignment of Highway 7 between Locust Hill and Green River.

Natural Environment

Although both pairs of route segments are generally comparable the southern route is preferred because:

- it crosses fewer permanent streams;
- it affects fewer hectares of recharge area;
- it is further removed from sensitive headwater areas;
- it affects marginally less wooded areas and wildlife habitat;
- it crosses the Little Rouge corridor in proximity to the existing rail corridor, and the West Duffins corridor close to Green River, thereby, reducing the intervals of urban interference.

Social Environment

The southern route is preferred over the northern across all indicators, except with regards to visual impacts where both routes are identical. The southern route will also have proximity effects on the recreational amenities of the Seaton Hiking Trail and the Seaton Flying Club. However, the southern route is preferred because:

- it displaces fewer residences;
- fewer residences will experience noise increases of 5 dB to 20 dB;
- exposes fewer residences to noise levels of 55 dB or greater, post construction;
- more of the properties affected are publicly owned;
- it satisfies a provincial land use objective of buffering the hamlet of Green River from the Seaton Community;
- it poses less of a constraint for the Cornell Project.

Economic Environment

The southern route was considered preferable primarily because it is more compatible with provincial and municipal development objectives for Cornell, it creates the desired buffer between Seaton and Green River and provides direct transportation service to the Pickering Airport site while retaining better flexibility to extend service into Seaton.

Agriculture

The differences in route impacts to the agricultural component are considered to be marginal and the tradeoffs involved do not favour one route over the other. While the northern route creates greater fragmentation of farm properties (17 vs 12 severances) and a greater number of severances less than 20 ha, the southern route displaces 8% more prime agricultural land and 8% more farm property.

Cultural Environment

Both routes have relatively similar impacts on built heritage features. The northern route has one additional feature (historic marker) in the right-of-way but it can be readily relocated. Impacts to registered archaeological sites are also similar. The southern route is less desirable based on potential impacts to cultural landscape components (West Duffins Creek valley, historical settlement of Whitevale, and heritage structures east of the Highway 7 crossing).

Transportation and Engineering

The northern route is more curvilinear than the southern. The northern route would require a modified non-standard interchange configuration to accommodate a ramp for the proposed interchange with the Markham Bypass. Both routes would result in skewed interchange configurations at the Durham-York Line. The southern route would necessitate a realignment of Highway 7 in the vicinity of the Durham-York Line, which would coincidentally improve the directness of Highway 7. At the Durham-York Line interchange the northern route would require difficult construction considerations as the interchange would be bounded by the CPR Havelock Subdivision and West Duffins Creek. The southern route segment provides greater directness of route.

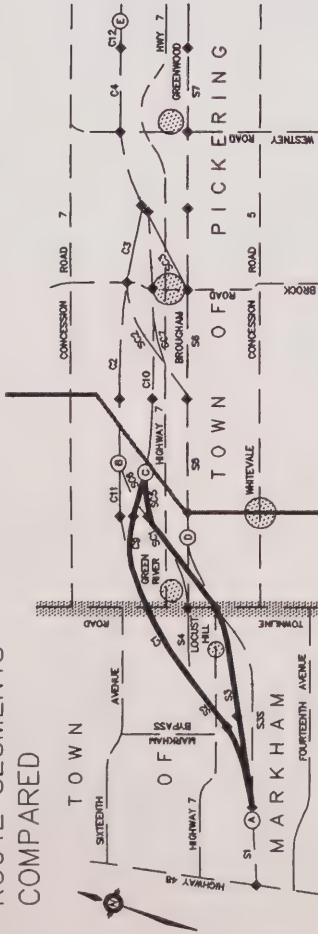
Summary

The analysis at this stage confirmed the findings at Stages 1 and 2, that there are advantages to a route south of Locust Hill and Green River over one to the north. Major considerations included preservation of significant woodlots, preservation/reinforcement of hamlet boundaries and compatibility with municipal, provincial and federal development objectives. Potential natural environmental and cultural landscape impacts will be mitigated through sensitive structural (bridge) and landscaping design.

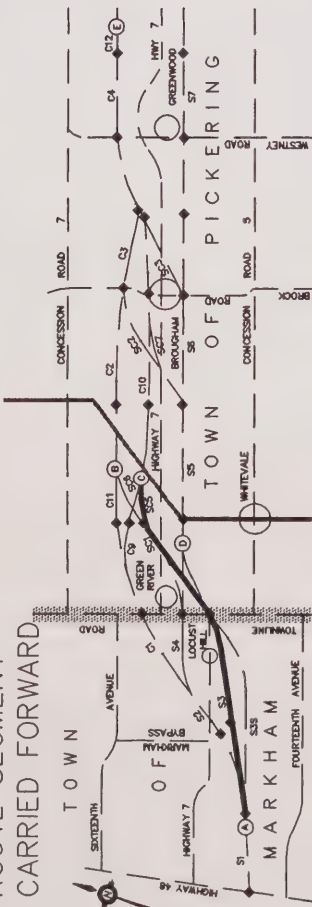
STAGE 4

NORTH OF LOCUST HILL & GREEN RIVER vs SOUTH OF LOCUST HILL & GREEN RIVER

ROUTE SEGMENTS COMPARED



ROUTE SEGMENT CARRIED FORWARD



RELATIVE CAPABILITY TO SATISFY EVALUATION CRITERIA	FACTOR						
	NATURAL	SOCIAL	ECO.	AGRICULT.	CULT.	TRANSP./ENG.	
SEGMENT	Ecosystems Surface Water Fishes Vegetation Wildlife Hydrogeology Waste Mgmt.	Communities Recreation Aesthetics Noise	Land Use Non-Farm Comm.	Physical Resources Farm Operations Area Operations	Historical Archaeological Cult. Landscape	Network/Service Geometrics Staging Construction Cost	
N OF LOCUST HILL & GREEN RIVER (S2 + C1 + C9)	●	●	●	●	●	●	●
S OF LOCUST HILL & GREEN RIVER (S3 + S3/SC1 + SC1 + SC5)	●	●	●	●	●	●	●
RELATIVE CAPABILITY TO SATISFY EVALUATION CRITERIA:							● → MOST EFFECTIVE

HIGHWAY 407 / TRANSITWAY
MARKHAM ROAD EASTERLY TO
HIGHWAY 7 EAST OF BROCK ROAD

LEGEND:	
ROUTE SEGMENTS COMPARED	SUMMARY COMPARISON AND RATIONALE FOR SELECTION OF ROUTE SEGMENT CARRIED FORWARD
ROUTE SEGMENT CARRIED FORWARD	
RELATIVE CAPABILITY OF ROUTE SEGMENTS TO SATISFY EVALUATION CRITERIA	

SUMMARY COMPARISON

SEGMENT FACTOR	N OF LOCUST HILL & GREEN RIVER (S2 + C1 + C9)	S OF LOCUST HILL & GREEN RIVER (S3 + S3/SC1 + SC1 + SC5)
NATURAL ENVIRONMENT	<ul style="list-style-type: none">Greater impacts to high quality remnant woodlots. Displaces 54% of 7 ha mature sugar maple bush (Lot 9/10 Con 9 Markham).10 wells within right-of-way influence area.101 ha recharge area encroachment (cut section).	<ul style="list-style-type: none">Proximity to north end of MTRCA Whitevale Corridor but spanned to maintain wildlife corridor.Encroachment on 7% (0.5 ha) of 7 ha mature sugar maple bush (Lot 9/10 Con 9 Markham).64 ha recharge area encroachment.
SOCIAL ENVIRONMENT	<ul style="list-style-type: none">Displacement of 9 residences including 5 privately owned in Highway 7 and Tenth Line area.11 residences would experience noise impacts greater than 5dBA11 residences would experience resultant noise level over 55dBA.	<ul style="list-style-type: none">Potential buffer between Locust Hill/Green River and future urban area. Higher potential to preserve integrity of hamlets.4 residences experience significant increase in noise levels of 5dBA.7 residences displaced.Intrusive effects on Seaton Trail recreational amenities but valley spanned to maintain linear open space connections.
ECONOMIC ENVIRONMENT	<ul style="list-style-type: none">Conflict with municipal development objectives for proposed East Markham (Cornell) Community, hamlets of Locust Hill and Green River.Conflict with federal objectives for Pickering Airport Site.Incompatible with Durham Draft O.P. and Town of Pickering land use objectives.	<ul style="list-style-type: none">Compatible with East Markham (Cornell) community proposals.Compatible with municipal development plans for Locust Hill and Green River.Meets Seaton Community objective of buffer for Green River.
AGRICULTURE	<ul style="list-style-type: none">Creates greater fragmentation of operations and greater number of parcels less than 20 ha (10).	<ul style="list-style-type: none">Requires 8% more good agricultural land and more farm property (marginal difference).
CULTURAL ENVIRONMENT	<ul style="list-style-type: none">Lower degree of impacts to West Duffin Creek valley, Whitevale, Seaton Heritage Trail.	<ul style="list-style-type: none">Greater impacts to cultural landscape components (West Duffin Creek valley, historical settlement of Whitevale, grouping of heritage structures on Highway 7 east of crossing).
TRANSPORTATION & ENGINEERING	<ul style="list-style-type: none">Disadvantages of interchange at York Road 30 (Townline)<ul style="list-style-type: none">-difficult and expensive construction due to proximity to CP Rail line and West Duffin Creek-traffic operational problems (proximity to Hwy 7)-requires high fill at West Duffin Creek valley crossingNon-standard interchange at Markham Bypass for Highway 7 moves.	<ul style="list-style-type: none">Requires realignment of Highway 7 between Locust Hill and Green River.Skew (55°) angle at York Road 30.Better traffic/transit service, geometric, construction attributes.
SUMMARY RATIONALE	This stage confirmed the advantages of a route south of Locust Hill and Green River (S3 + S3/SC1 + SC1 + SC5) over one to the north. Major considerations included preservation of significant woodlots, preservation/reinforcement of hamlet boundaries and compatibility with municipal, provincial and federal development objectives. Potential natural environmental impacts to the West Duffin Creek valley will be mitigated through sensitive structural (bridge) design.	

STAGE 4 EVALUATION

EXHIBIT
5.4.5

5.4.3.5 Through Pickering Airport Site (Links S3/SC1 + SC1 + SC5 + C10) vs Through Seaton Community (Links S3/S5 + S5 + S6 + SC3) - Evaluated at Stage 5

The following discussion is a comparative analysis of the paired route segments evaluated in Stage 5. For convenient quantification of the potential impacts of each alternative, please refer to the comparative analysis in Appendix 13. The comparison and rationale for selecting the alternative to be carried forward are summarized in Exhibit 5.4.6.

Natural Environment

The northern route is preferred because:

- it affects fewer watercourses and associated fish habitat;
- it affects less headwater and recharge areas;
- it affects less wooded areas and wildlife habitat

Social Environment

Both routes will have proximity effects on the recreational amenities of the Seaton Hiking Trail and the Seaton Flying Club. The southern route is preferred over the northern across all other indicators, except with regards to visual impacts where both routes are identical. The southern route is preferred because:

- it displaces fewer residences;
- fewer residences will experience noise increases of 5 dB to 20 dB;
- it exposes fewer residences to noise levels of 55 dB or greater, post construction;
- fewer properties are required, with a significant portion already publicly owned;
- it satisfies a provincial land use objective of buffering the hamlet of Green River from the Seaton Community.

Economic Environment

The southern route segment is preferred since it is more compatible with Federal Government, Region of Durham and Town of Pickering land use objectives by placing the Highway 407 corridor within Concession 5 through Seaton as opposed to Concession 6 through the Pickering Airport lands. In particular, the route through the Airport site has the disadvantage of limiting design flexibility in future airport planning exercises, whereas the current planning for Seaton will permit the flexibility required to place Highway 407 south of Highway 7. While both routes would buffer Green River from the Seaton lands, the southern route would also buffer Brougham from Seaton.

Agriculture

The northern route is marginally less desirable in terms of permanent loss of prime agricultural land since it consumes 234 ha of Class 1 and Class 2 land while the southern consumes only 221 ha of Class 1 and Class 2 land. The northern route would impact 8 farm operations, whereas only 6 would be directly affected by the southern route. While the southern option would displace 15 farm buildings (compared to 4 for the northern route), the structures affected are on tenant occupied publicly owned lands and are in poor to fair condition. The over-riding factor favouring the southern option is the lower degree of impact to a local nursery operation, which could remain in operation.

Cultural Environment

The routes are similar with respect to the number of built heritage features in the right-of-way. However, impacts are considered greater on the northern route due to the group value of the four residences in Brougham which contribute to the integrity of the historical settlement. The northern route is also less desirable because an Iroquoian Village is within the right-of-way and would require avoidance or salvage.

Transportation and Engineering

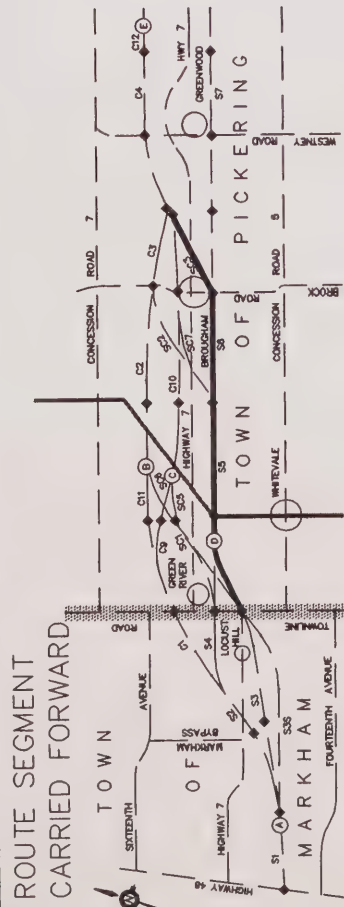
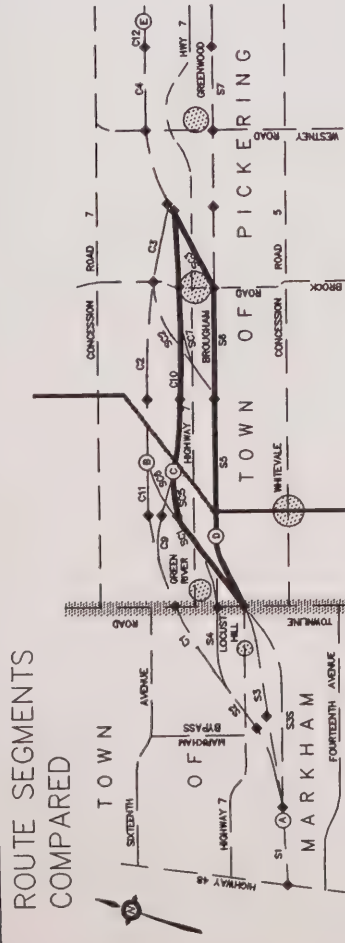
Both routes are similarly curvilinear. The northern route has an additional non-standard interchange configuration at the Durham-York Line.

Summary

A route through Seaton Community (Segment S3/S5 + S5 + S6 + SC3) is preferred primarily because it is more compatible with municipal provincial and federal land use and transportation service aspirations in the area. It also results in fewer social and cultural impacts to the hamlets of Green River and Brougham and on a significant archaeological site. The potential impacts to an unnamed tributary of the Duffins Creek located east of Brougham will be mitigated to some degree by introducing a bridge crossing instead of a culvert.

STAGE 5

THROUGH PICKERING AIRPORT SITE vs THROUGH SEATON COMMUNITY



RELATIVE CAPABILITY TO SATISFY EVALUATION CRITERIA	FACTOR						TRANSP./ENG. COST
	NATURAL	SOCIAL	ECO.	AGRICULT.	CULT.		
SEGMENT	ECOSYSTEMS SURFACE WATER FISHERIES VEGETATION WILDLIFE HYDROLOGY WASTE MGMT.	COMMUNITIES RECREATION AESTHETICS NOISE	LAND USE NON-FARM COMM.	PHYSICAL RESOURCES FARM OPERATIONS AREA OPERATIONS	HISTORICAL ARCHAEOLOGICAL CULT. LANDSCAPE		NETWORK/SERVICE GEOMETRICS STAGING CONSTRUCTION CONSID.
THROUGH PICKERING AIRPORT SITE (S3/SC1 + SC1 + SC5 + C10)	●	●	●	●	●	●	●
THROUGH SEATON COMMUNITY (S3/S5 + S5 + S6 + SC3)	●	●	●	●	●	●	●

RELATIVE CAPABILITY TO SATISFY EVALUATION CRITERIA: ● → ● MOST EFFECTIVE

SUMMARY COMPARISON		
SEGMENT FACTOR	THROUGH PICKERING AIRPORT SITE (S3/SC1 + SC1 + SC5 + C10)	THROUGH SEATON COMMUNITY (S3/S5 + S5 + S6 + SC3)
NATURAL ENVIRONMENT	<ul style="list-style-type: none"> • Fewer impacts on fisheries resources. • Displaces less/lower quality vegetation and wildlife habitat 52% less woodland area). • More (10) wells within right-of-way influence zone. • 181 ha recharge area encroachment. 	<ul style="list-style-type: none"> • Minor encroachment on area of moderately high potential for groundwater upwelling at West Duffin Creek. Greater potential for alteration of fisheries habitat/spawning areas (Duffin tributaries). Mitigation possible by spanning creek valleys. • Encroachment (3.0 ha) on north end of MTRCA Whitevale Corridor ESA. • 96 ha recharge area encroachment.
SOCIAL ENVIRONMENT	<ul style="list-style-type: none"> • Encroachment on north end of Brougham. • Displaces 19 residences (tenant occupied). • Visual intrusion on Brougham; potential traffic impacts. • Greater number of residences experience significant noise increase (11) and noise levels over 55 dBA (8). 	<ul style="list-style-type: none"> • Displaces 17 residences (tenant occupied). • More potential impacts to Seaton Trail recreational amenities but valley spanned to maintain linear open space connections. • 2 residences would experience a 5 dBA increase in noise levels. • 2 residences would have resultant noise level over 55 dBA.
ECONOMIC ENVIRONMENT	<ul style="list-style-type: none"> • Less compatible with municipal and provincial development objectives for hamlets and Seaton. • Potential conflict with Pickering Airport airside facilities and peripheral land use. • Not compatible with Durham Draft O.P. and the Town of Pickering desires for route in Concession 5. 	<ul style="list-style-type: none"> • Compatible with Region of Durham/Town of Pickering development plans for Hamlets of Green River and Brougham. • Compatible with provincial objectives for Seaton Community. • Retains flexibility for dedicated access to Pickering Airport site.
AGRICULTURE	<ul style="list-style-type: none"> • Displaces 4 farm buildings (tenant operations). • Major adverse impacts to Nursery operation (severance; proximity to buildings; requires 15% of parcel). Indirect effects could jeopardize continuance of operation. 	<ul style="list-style-type: none"> • Displaces 15 farm buildings (tenant operations). • Nursery impacts limited to southeast corner.
CULTURAL ENVIRONMENT	<ul style="list-style-type: none"> • 6 ordinary heritage features (4 in Brougham) are within right-of-way. • Impacts to historical settlement of Brougham and moderately sensitive rural/agricultural landscape. • 2 registered archaeological sites (Hobbs Site—isolated find spot; Peter Webb Site II—Iroquoian Village) within right-of-way. 	<ul style="list-style-type: none"> • 5 heritage features within right-of-way. • 1 registered archaeological site (Salgo Site—Archaic Campsite) within right-of-way.
TRANSPORTATION & ENGINEERING	<ul style="list-style-type: none"> • Significant length (2.8 km) of facility has maximum acceptable longitudinal grade (2.2%). • Skew (55°) angle at Sideline 30. 	<ul style="list-style-type: none"> • More desirable longitudinal grades (none in excess of 1.1%). • Sideline 14 interchange located on 1500 m curve; skew (55°) angle with Highway 407/Transitway.
SUMMARY RATIONALE A route through Seaton Community (Segment S3/S5 + S5 + S6 + SC3) is preferred primarily because it is more compatible with municipal, provincial and federal land use and transportation service aspirations in the area. It also results in fewer social and cultural impacts to the hamlets of Green River and Brougham. Potential impacts to Duffin Creek tributaries will be mitigated to some degree by introducing bridge crossings instead of culverts.		

HIGHWAY 407 / TRANSITWAY MARKHAM ROAD EASTERLY TO HIGHWAY 7 EAST OF BROCK ROAD	LEGEND:	SUMMARY COMPARISON AND RATIONALE FOR SELECTION OF ROUTE SEGMENT CARRIED FORWARD		STAGE 5 EVALUATION 5.4.6 EXHIBIT
		ROUTE SEGMENTS COMPARED		
		ROUTE SEGMENT CARRIED FORWARD		
		RELATIVE CAPABILITY OF ROUTE SEGMENTS TO SATISFY EVALUATION CRITERIA		

5.4.3.6 North of Greenwood (Links SC3 + C4 + C12 + CS1) vs South of Greenwood (Links S7 + S7/S8) - Evaluated at Stage 6

A comparative analysis of the two route segments north and south of Greenwood were evaluated in Stage 6. Although the undertaking for which approval is being sought through this EA does not go as far as Greenwood, it is important to include this paired-comparison to determine if a northern or southern route is preferred. For convenient quantification of the potential impacts of each alternative, please refer to the comparative analysis in Appendix 14. The comparison and rationale for selecting the alternative to be carried forward are summarized in Exhibit 5.4.7.

Natural Environment

Both route segments cross an identical number of streams and fisheries, including those with nationally and regionally rare species. Hydrogeologically speaking, whereas the northern route encroaches on a larger area of recharge area, the southern encroaches on a larger area of aquifer. Both routes differ significantly, however, with respect to their hydrological constraints. Of major consideration along the southern route is a drainage complex southeast of Brougham which forms the tributaries to Duffins Creek. Aside from necessitating extensive realignments to local drainage patterns, traversing the area involves encroachment on an extensive area of groundwater upwelling and seepage, which has accompanying considerations related to subgrade stability and groundwater quality. As a general rule, it is desirable to remain as far as possible from sensitive headwater areas. The southern route also has marginally higher areal impacts on wooded areas, whereas the northern route has moderately higher impacts on wildlife habitat, which are considered to have moderate value. Overall, the northern route is preferred.

Social Environment

The northern route displaces marginally more residences, but is preferred because:

- significantly fewer residences will experience noise increases of 5 dB to 20 dB;
- it exposes fewer residences to noise levels 55 dB or greater, post construction;
- the resultant noise levels along the southern are also of greater magnitude than the northern route: up to 70 dB; and
- the southern route would require a 20 m high bridge over Duffins Creek.

Economic Environment

At the time of the Route Planning Study, the northern route was not fully compatible with the Town of Pickering's Official Plan land use objectives or the Durham Region Official Plan with respect to the desire to have the route in Concession 5. However, neither the Region nor the Town expressed major concerns in this regard (both identified the northern option as acceptable). Moreover, the northern route satisfies the Town's desire to provide some functional definition of the northern limit of growth for the proposed cluster of Kinsale. The northern route is considered to be more compatible to the east of the study area with the Town of Whitby's desire to preserve

and enhance existing land uses (Macedonian Village, Heber Down Conservation Area).

Agriculture

The southern route is preferred because:

- it consumes 8% less prime farmland;
- it affects almost half the number of agricultural operations and infrastructure (including more capital intensive uses); and
- it results in less fragmentation of operations.

Cultural Environment

There are tradeoffs for this component which result in the northern route being marginally preferable to the southern route. The right-of-way of the northern route contains six historically significant structures (including 4 excellent residences), while only 1 similar structure is found within the southern right-of-way. However, a possible interchange at Salem Road with the southern route will encroach onto the Salem Cemetery and although both routes would disrupt the cultural landscape of 3 riverine systems, the effects of the southern route at Duffins Creek would be more difficult to mitigate. Both right-of-ways contain one registered archaeologically significant site but the southern route is also within 100 m of the Waltham Site, an Iroquoian Village.

Transportation and Engineering

Greater directness of route would result with the selection of the southern route segment, especially in conjunction with the links S5 and S6 which were previously carried forward from the Stage 5 Evaluation. In addition to being substantially more curvilinear, the northern route segment features much less desirable geometrics. However, the southern route would result in a number of poor interchange site conditions and would create more complications related to construction detour accesses for residences. While both routes cross a 230 kV hydro tower corridor, only the southern route would require a tower relocation.

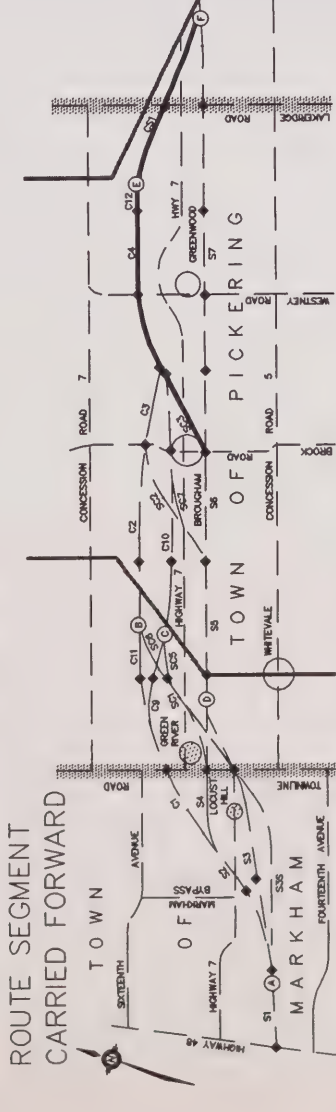
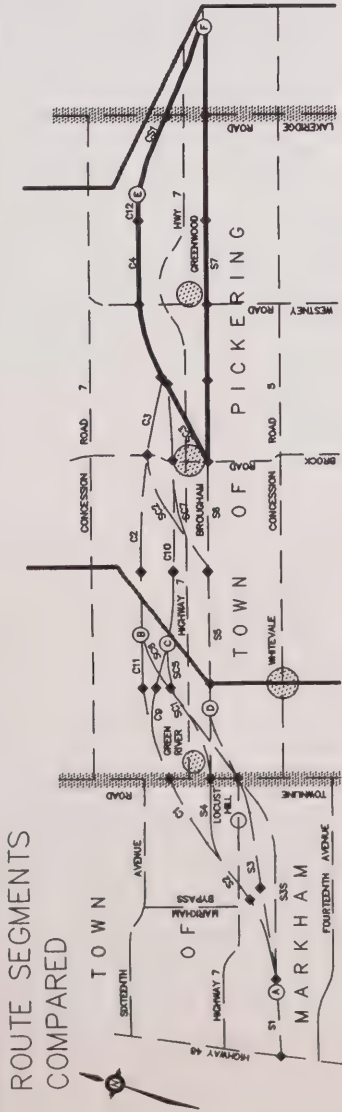
Summary

Segment SC3 + C4 + C12 + CS1 (North of Greenwood) was carried forward since it exhibited a higher capability to satisfy evaluation criteria for 5 of 6 factor groups (south is marginally more desirable for agricultural operations). In particular, the northern segment was selected because of the lower degree of impacts to the Hamlet of Greenwood and fisheries, vegetation and wildlife components associated with the Duffin Creek valley and the Greenwood Conservation Area.

There were three other stages to the Route Planning Study involving paired comparison of alternatives to the east. However, these did not affect the technically preferred route between Markham Road and Highway 7 east of Brock Road, and therefore, are not discussed in this report.

STAGE 6

NORTH OF GREENWOOD vs SOUTH OF GREENWOOD



RELATIVE CAPABILITY TO SATISFY EVALUATION CRITERIA		FACTOR						TRANSP./ENG.
		NATURAL	SOCIAL	ECO.	AGRICULT.	CULT.	NETWORK/SERVICE	
NORTH OF GREENWOOD (SC3 + C4 + C12 + CS1)		●	●	●	●	●	●	●
SOUTH OF GREENWOOD (S7 + S7/S8)		●	●	●	●	●	●	●
RELATIVE CAPABILITY TO SATISFY EVALUATION CRITERIA: ● → ● MOST EFFECTIVE								

SUMMARY COMPARISON		
SEGMENT	NORTH OF GREENWOOD (SC3 + C4 + C12 + CS1)	SOUTH OF GREENWOOD (S7 + S7/S8)
FACTOR		
NATURAL ENVIRONMENT	<ul style="list-style-type: none">Lower degree of Duffin Creek ecosystem disruption/fragmentation.More watercourse crossings (13) but higher fisheries mitigation potential (bridges vs. culverts).	<ul style="list-style-type: none">Fewer watercourse crossings (11) but greater potential impacts on Duffin Creek fishery resources (habitat, potential groundwater upwelling areas).Affects more diverse/extensive forestry/wildlife units.
SOCIAL ENVIRONMENT	<ul style="list-style-type: none">Less fragmentation of Greenwood community.Displaces 17 residences.Significant noise increases for 29 residences.Potential to draw traffic through Greenwood.	<ul style="list-style-type: none">Significant impacts to community integrity of Greenwood (Greenwood Road, Westney Road).Displaces 14 residences.Significant noise increases for 40 residences (Greenwood, Macedonian Village).Visual intrusion with 20 m bridge over Duffin Creek/Greenwood Road.
ECONOMIC ENVIRONMENT	<ul style="list-style-type: none">Acceptable degree of compatibility with Town of Pickering land use and economic development objectives.More compatible with Town of Whitby land use objectives.	<ul style="list-style-type: none">Less compatible with Town of Whitby desire to be further removed from Macedonian Village and Heber Down Conservation Area.
AGRICULTURE	<ul style="list-style-type: none">Greater impacts to livestock and specialty operations.11 farms operations affected.	<ul style="list-style-type: none">Affects fewer and less capital intensive operations.5 farms operations would be affected.
CULTURAL ENVIRONMENT	<ul style="list-style-type: none">More historical features affected (6 within right-of-way; 4 rated as excellent).Higher mitigation potential for impacts to cultural landscape of Duffin Creek valley.1 archaeological site (Salgo Site-Archaic Campsite) within right-of-way. High mitigation potential.	<ul style="list-style-type: none">Greater disruption of Duffin Creek valley cultural landscape. Low mitigation potential (long high bridge required).Encroachment on Salem Cemetery property with Salem Road interchange.
TRANSPORTATION & ENGINEERING	<ul style="list-style-type: none">Potential for more traffic north of Westney Road.Fewer major impacts during construction.	<ul style="list-style-type: none">Undesirable grade (3%) for 500 m.Transit grade difficulties.Long (500 m) section of cut greater than 10 m.2 interchanges in cut greater than 10 m.Difficult detours on Audley Road, Halls Road, Westney Road.
SUMMARY RATIONALE Segment SC3 + C4 + C12 + CS1 (North of Greenwood) was carried forward since it exhibited a higher capability to satisfy evaluation criteria for 5 of 6 factor groups (south is marginally more desirable for agricultural operations). In particular, the northern segment was selected because of the lower degree of impacts to the Hamlet of Greenwood and fisheries, vegetation and wildlife components associated with the Duffin Creek valley and the Greenwood Conservation Area.		

HIGHWAY 407 / TRANSITWAY
MARKHAM ROAD EASTERLY TO
HIGHWAY 7 EAST OF BROCK ROAD

LEGEND:	ROUTE SEGMENTS COMPARED	
	ROUTE SEGMENT CARRIED FORWARD	RELATIVE CAPABILITY OF ROUTE SEGMENTS TO SATISFY EVALUATION CRITERIA

STAGE 6 EVALUATION

EXHIBIT
5.4.7

As well, as discussed in Section 5.4.1.3, the northern links (C2 and C3) that passed through the airport lands were not carried forward for analysis. This was because a freeway/transitway in this area would conflict with the Government of Canada's plans for these lands, and the Province is jurisdictionally unable to force acceptance of an alternative against the federal government's will.

The compilation of all of the segments selected from the paired comparisons carried on in Stages 1-6 became the Technically Preferred Route for Highway 407/Transitway between Markham Road and Greenwood.

5.4.3.7 Reviews/Refinements to the Technically Preferred Route

Following the selection of the Technically Preferred Route, presentations were made to ministries, agencies, and the public in order to provide information and receive comments and concerns. In the summer of 1991, an information package presenting the Technically Preferred Route was submitted to agencies, ministries, and interest groups in an effort to solicit further input. As a result of this input and discussions with the Town of Markham, an alignment shift in Link S3 was developed in August 1992. The change shifted Link S3 southerly between 9th Line and 10th Line in the Town of Markham. This new alignment shift was suggested to reduce the impact at the Little Rouge Creek crossing. The alternative alignment (Link S3S) crosses Little Rouge Creek south of the CP Rail structure, approximately 400 m south of Link S3 which formed part of the 1991 Technically Preferred Route.

A comparative analysis of the two route segments was carried out. For convenient quantification of the potential impacts of each alternative, please refer to the comparative analysis in Appendix 15. The comparison and rationale for selecting the alternative to be carried forward are summarized in Exhibit 5.4.8.

Natural Environment

There is no significant difference between the two segments with respect to the number of crossings; however, Segment S3S is preferred because:

- it crosses the Little Rouge at a less sensitive location south of the CP railway where the creek is wider and slower flowing with less shade from mainly cedar trees;
- it does not encroach on woodland unit 87 - a very significant woodlot which the Town of Markham would like to protect due to its size, quality and species content/diversity

Social Environment

The only significant difference between the two segments is with respect to the indicator 'Residences displaced'. At 10th Line one residence would be displaced with Segment S3 but Segment S3S would displace two different residences. All of these properties are owned by ORC.

The overall impact with respect to noise is expected to be less with Segment S3S due to the fact that the impact on Locust Hill would be reduced (i.e. noise levels attributable to Highway 407 would be reduced approximately 5 dB to 55 - 60 dB Leq). With Segment S3 the highway would be about 400 m from residences and is in high fill (i.e. over 8m) through this section. With Segment S3S the highway would not be closer than 600 m to homes, and the section of high fill would be 850 m from residences.

This benefit is considered to outweigh the marginal (0 - 5 dB) increases to 5 primarily publicly owned residences on Tenth Line which would be newly affected by Segment S3S.

Economic Environment

Segment S3S is preferred because it would shift the right-of-way approximately 100 m to 300 m further south between Ninth Line and the Markham Bypass providing more land for the Cornell Community than would Segment S3.

Agriculture

Segment S3S will affect 3 more farm properties than Segment S3 but will landlock 2 fewer properties.

Cultural Environment

The effects on heritage buildings is essentially the same with the two alternatives. Segment S3S has less impact on the historical settlement of Locust Hill.

While Segment S3 does not impact any known archaeological sites, Segment S3S lies adjacent to two significant archaeological sites located immediately south of the right-of-way.

Transportation and Engineering

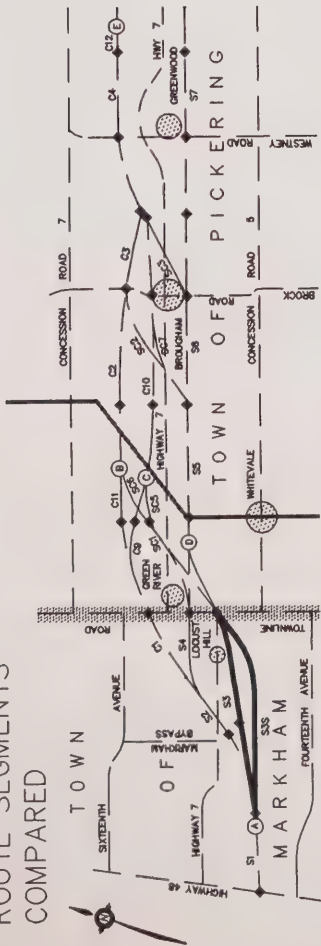
There is no significant difference between the two segments for the four interchanges the study is protecting for: Markham Road; Ninth Line; Markham Bypass; and Durham-York Line. S3S is preferred because:

- it avoids a significant bend in the Little Rouge Creek associated with Segment S3 which would have given less flexibility for the placement of piers to avoid impacts to the creek; and
- it has a better alignment in relation to the proposed Durham-York Line interchange.

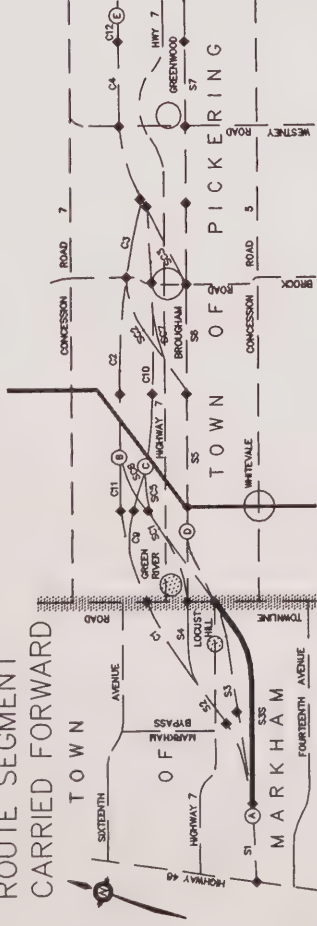
REFINEMENT TO TECHNICALLY PREFERRED ROUTE

CROSSING OF LITTLE ROUGE CREEK NORTH OF CP RAIL VS SOUTH OF CP RAIL

ROUTE SEGMENTS COMPARED



ROUTE SEGMENT CARRIED FORWARD



SEGMENT	FACTOR						
	RELATIVE CAPABILITY TO SATISFY EVALUATION CRITERIA	NATURAL	SOCIAL	ECO.	AGRICULT.	CULT.	TRANSP./ENG.
NORTH OF CP RAIL (S3)		ECOSYSTEMS SURFACE WATER FISHERIES VEGETATION MILDLIFE HYDROLOGY WASTE MGMT.	COMMUNITIES RECREATION AESTHETICS NOISE	LAND USE NON-FARM COMM.	PHYSICAL RESOURCES FARM OPERATIONS AREA OPERATIONS	HISTORICAL ARCHAEOLOGICAL CULT. LANDSCAPE	NETWORK/SERVICE GEOTECHNICAL STAGING CONSTRUCTION CONSID.
SOUTH OF CP RAIL (S3S)							
RELATIVE CAPABILITY TO SATISFY EVALUATION CRITERIA:							MOST EFFECTIVE

HIGHWAY 407 / TRANSITWAY
MARKHAM ROAD EASTERLY TO
HIGHWAY 7 EAST OF BROCK ROAD

ROUTE SEGMENTS COMPARED	
ROUTE SEGMENT CARRIED FORWARD	
RELATIVE CAPABILITY OF ROUTE SEGMENTS TO SATISFY EVALUATION CRITERIA	

SUMMARY COMPARISON AND RATIONALE FOR SELECTION OF ROUTE SEGMENT CARRIED FORWARD	

SUMMARY COMPARISON

FACTOR	SEGMENT	S3	S3S
NATURAL ENVIRONMENT		<ul style="list-style-type: none">Greater impact to valley vegetation at Little Rouge Creek crossing. Requires 7ha of upland deciduous forest which is inhabited by deer.Greater impact on fish habitat at the Little Rouge Creek crossing where the creek is fast flowing and well shaded.Requires approximately 15% of significant woodlot southwest of Hwy 7 and the Markham Bypass.Greater impact on Hamlet of Locust Hill. Highway (including high fill section) would come within 400 m of hamlet.Avoids significant impact on private property. (undeveloped Toronto Catholic Cemetery Association Property).One residence displaced.Limits the Ninth Line development due to proximity of Segment S3.	<ul style="list-style-type: none">Requires only 4ha of valley vegetation which is of lesser quality than Segment S3 and consists mainly of cedar.Crossing of Little Rouge Creek is south of CP Rail where the fish habitat is of lower quality since the creek is slower and less shaded.Avoids impacting significant woodlot southwest of Hwy 7 and the Markham Bypass.Significantly less noise and visual impact on Locust Hill. Hill fill section of Hwy would be 850m from hamlet with Hwy not coming closer than 600m.3 properties on 10th Line (owned by Ontario Land Corporation) would experience an increase in noise and visual intrusion.Two residences displacedSegment S3S is between 100m and 300m south of Segment S3 between 9th Line and Markham Bypass. This would allow the Cornell Community to be expanded in the order of 15-25 ha.6 farm operations greater than 20ha in size would be impacted. All farms are owned by Ontario Land Corporation.
SOCIAL ENVIRONMENT			
ECONOMIC ENVIRONMENT			
AGRICULTURE			
CULTURAL ENVIRONMENT			
TRANSPORTATION & ENGINEERING			
SUMMARY RATIONALE			
Segment S3S is preferred because it reduces the impact upon valley vegetation and fish habitat at the Little Rouge Creek crossing: offers superior preservation of high quality woodlot ecosystems in the Town of Markham; Significantly reduces the impact of the Transportation Corridor on the Hamlet of Locust Hill and has a more desirable horizontal alignment. Segment S3 is noted as superior to S3S with respect to agriculture. However, the significance of this is reduced somewhat by the fact that all the agriculture land is owned by OLC.			

LINK S3S EVALUATION

EXHIBIT 5.4.8

Segment S3S is only 150 m longer than Segment S3. However, the Little Rouge Creek Crossing would cost approximately \$400,000 more at Segment S3S than at Segment S3. This additional cost is not considered significant, given the overall costs for the project.

Segment S3S has a much greater impact on the undeveloped lands owned by the Archdiocese of Toronto - Catholic Cemeteries.

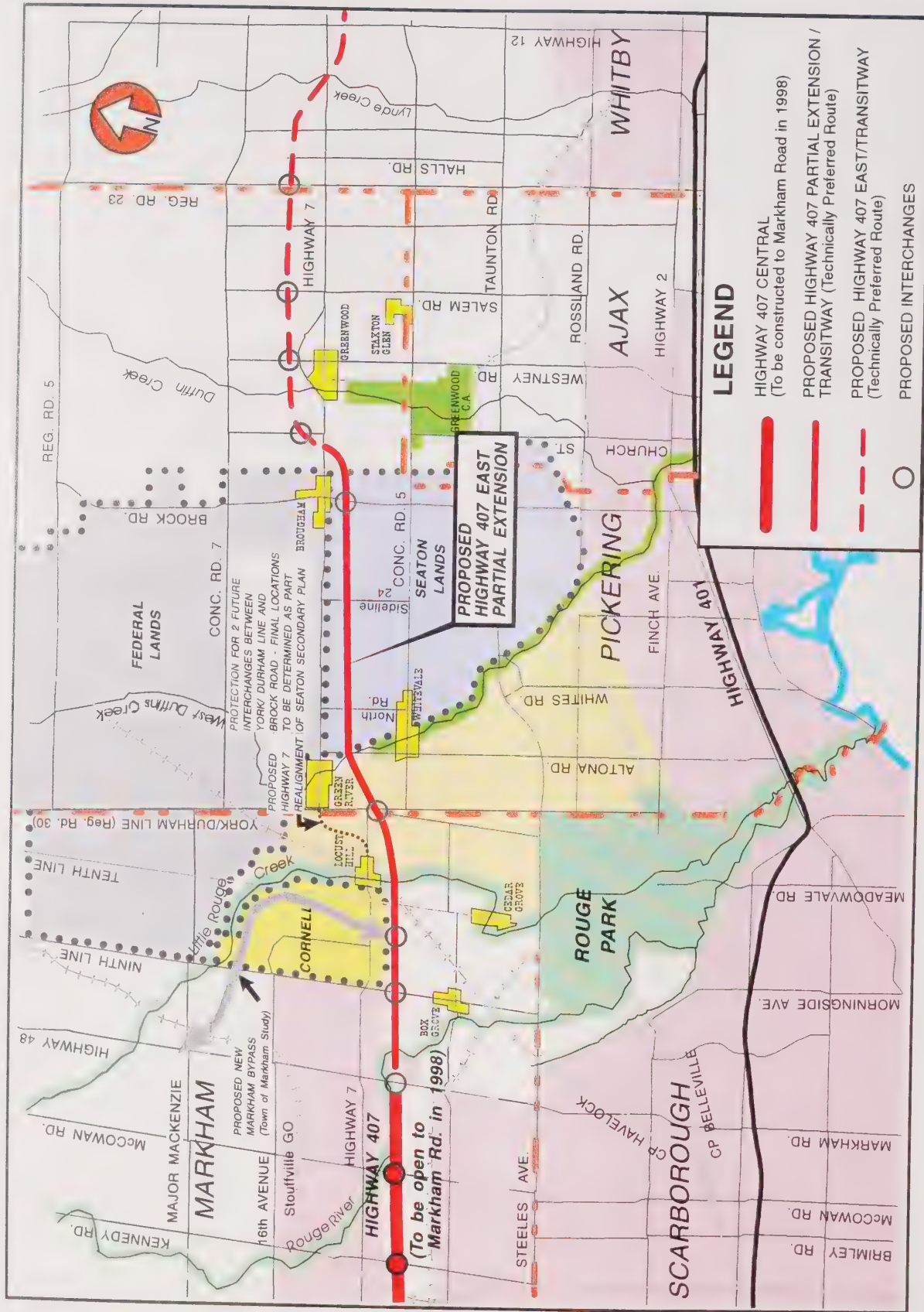
Summary

The technically preferred route was subsequently modified to include Link S3S in place of Link S3. The main reason for selecting Link S3S was that it crosses the Little Rouge Creek at a more desirable point in this area. This selection was broadly supported by the External Agencies. In addition, Link S3S allows for greater land availability for the Cornell Community.

5.4.4 Summary Rationale for the Selected Route

The selected route was identified as the Technically Preferred Route (see Exhibit 5.4.9) through the technical evaluation process and refined through the public consultation process. This route was deemed to be optimal from a number of standpoints including:

- The route takes maximum advantage of opportunities to avoid social, environmental, and engineering constraints identified through the data collection process;
- The route minimizes impacts upon established communities;
- The route is the most compatible with federal, provincial and municipal policy initiatives; and
- The preferred alternative is reasonably direct through the study area.



LEGEND

- HIGHWAY 407 CENTRAL
(To be constructed to Markham Road in 1998)
- PROPOSED HIGHWAY 407 PARTIAL EXTENSION / TRANSITWAY (Technically Preferred Route)
- PROPOSED HIGHWAY 407 EAST/TRANSITWAY (Technically Preferred Route)
- PROPOSED INTERCHANGES

HIGHWAY 407 / TRANSITWAY
MARKHAM ROAD EASTERLY TO
HIGHWAY 7 EAST OF BROCK ROAD

TECHNICALLY PREFERRED ROUTE
HIGHWAY 407 / TRANSITWAY

EXHIBIT
5.4.9

5.5 PARTIAL EXTENSION ALTERNATIVES CONSIDERED

5.5.1 Introduction

Once the technically preferred route for the Highway 407/Transitway Transportation Corridor from Markham Road to Highway 35/115 had been identified, the Ministry of Transportation planned to complete preliminary design, finalize the Environmental Assessment Report for the entire project and submit the EAR to the Ministry of Environment and Energy for review and approval under the EA Act. It was anticipated that construction of Highway 407 east of Markham Road would proceed in concert with the construction west of Markham Road; thereby, avoiding any traffic problems associated with Highway 407 ending at Markham Road.

However, in the early 1990s, the provincial government implemented a program to accelerate the construction of Highway 407 between Highway 403 in Mississauga and Markham Road in the Town of Markham. As a result of this program, Highway 407 is planned to open to Markham Road by 1998, well in advance of the probable construction of Highway 407 from Markham Road easterly to Highway 35/115 under MTO's conventional planning approach. Consequently, the Town of Markham, and the Regional Municipality of York expressed strong concerns about the anticipated traffic volumes with the termination of Highway 407 at Markham Road. Therefore, in the short term, the Ministry, in consultation with its municipal partners, undertook a Feasibility Study to identify and address potential traffic concerns associated with the planned 1998 opening of Highway 407 to Markham Road. The Feasibility Study documented the anticipated traffic condition (see Chapter 2) and considered options for addressing them. These options included a partial extension of Highway 407 east of Markham Road, utilizing the technically preferred route selected through the earlier route planning as described previously in this Chapter.

This Section describes the process followed in identifying, evaluating and selecting a preferred option for addressing the anticipated traffic problems in the vicinity of the Town of Markham including:

- Development of options;
- Analysis of options - including detailed traffic analysis and identification of impacts of each option; and
- Evaluation and selection of the preferred option.

Throughout the Feasibility Study, the project team consulted with technical agencies, municipalities, special interest groups and the public. This consultation process was described in Chapter 1.

5.5.2 Development of Highway 407 Partial Extension Options

In order to address the predicted increases in future traffic volumes on Markham Road, four basic alternatives were selected from a larger number of initial options by the project team, taking into consideration: the conclusions of the Route Planning Study; comments from the municipalities;

the results of the transportation analysis; the location of existing communities within the study area; and the potential impacts. The alternatives included the Do Nothing Alternative (i.e. not proceeding with a partial extension of Highway 407 east of Markham Road at this time) and three alternative extensions. The extension alternatives were developed by selecting incrementally longer segments of the technically preferred route for Highway 407 identified through the Route Planning Study, starting at Markham Road. Incrementally longer segments were considered in order to assess the traffic and community effects of moving the Highway 407 terminus point further east. The easterly limit for the alternatives was a location where the Technically Preferred Route for Highway 407 could be connected to Highway 7 east of Brock Road. This was considered to be the farthest easterly extension of Highway 407 that would be necessary to reduce the projected traffic volumes on Markham Road while minimizing potential traffic increases in existing communities.

For the conceptual development of partial extension options and the comparative assessment, the following were assumed:

- Markham Road
 - access to and from both the north and south would be provided
- 9th Line
 - given the location of the Hamlet of Box Grove on 9th Line at 14th Avenue, moves to and from the north only, were initially considered; however, full moves will likely be required in the future
- Proposed Markham Bypass / Markham / Scarborough Transportation Link
 - the existing Markham Bypass extends northerly from Highway 7 east of 9th Line. Currently, the Town of Markham is carrying out a study of the proposed Markham Bypass which is located east of the existing bypass along the periphery of the future Cornell community.
 - the technically preferred route for proposed Highway 407 identifies an interchange at the proposed Markham Bypass
 - the southerly extension of the proposed bypass to Highway 401 is referred to as the "Markham / Scarborough Transportation Link". Markham and Scarborough were the proponents of this project. A draft Environmental Assessment Proposal (EAP) was prepared to outline the manner in which a follow-on environmental assessment study would be conducted. The City of Scarborough; however, has withdrawn its support for any further study.
 - given the foregoing, only access to and from the north at the proposed Markham Bypass was assumed

- Durham-York Line
 - the Durham-York Line is the boundary road between York Region and Durham Region
 - it is a regional road and therefore access to and from the north and south was assumed
 - the Highway 407 interchange would necessitate the relocation of Highway 7 and the Concession 11 connection to the Durham-York Line
- Protection would be provided for two interchanges between Durham-York Line and Brock Road, the location of which will be determined as part of the planning for the Seaton Community
- Brock Road
 - access to and from the north and south would be provided
- Highway 7 east of Brougham
 - access to and from the east and west would be provided

The four basic options identified at this stage are discussed below.

- **Do Nothing** (see Exhibit 5.5.1)

The Do Nothing alternative constitutes the Province not taking any immediate action to address the anticipated traffic resulting from the opening of Highway 407 to Markham Road. This would mean that the traffic going to and from Highway 407 would use the existing transportation network and any future municipal improvements. This became the base case for assessing the alternatives.

- **Extend Highway 407 to the Markham Bypass** (see Exhibit 5.5.2)

In order to reduce projected traffic volumes on Markham Road, the easterly extension of Highway 407 to the proposed Markham Bypass was identified as the minimal extension for consideration. 9th Line was not considered to be a desirable terminal point due to adjacent suburban residential development.

This alternative involves the extension of Highway 407 (as an initial 4 lane freeway) easterly from Markham Road to the proposed Markham Bypass. The freeway would include interchanges permitting north/south movements at Markham Road; and north only movements at the 9th Line, and the Markham Bypass. In the event that the proposed Markham Bypass is not constructed before this section of Highway 407, it is proposed that a temporary connection to Highway 7 be provided.

- **Extend Highway 407 to the Durham-York Line (York Regional Road 30)** (see Exhibit 5.5.3)

In order to reduce potential traffic impacts through Locust Hill, the extension to Durham-York Line was identified. This alternative involves the extension of Highway 407 (4 lane freeway) to the Durham-York Line (Regional Road 30) with interchanges permitting north/south movements at Markham Road; initially north only movements at the 9th Line and the Markham Bypass; and north/south movements at the Durham-York Line.

In addition, a realignment of Highway 7 and Concession 11 connection to accommodate the interchange at the Durham-York Line would be required for this alternative and any other alternative requiring the Durham-York Line interchange.

- **Extend Highway 407 to Highway 7 East of Brock Road** (see Exhibit 5.5.4)

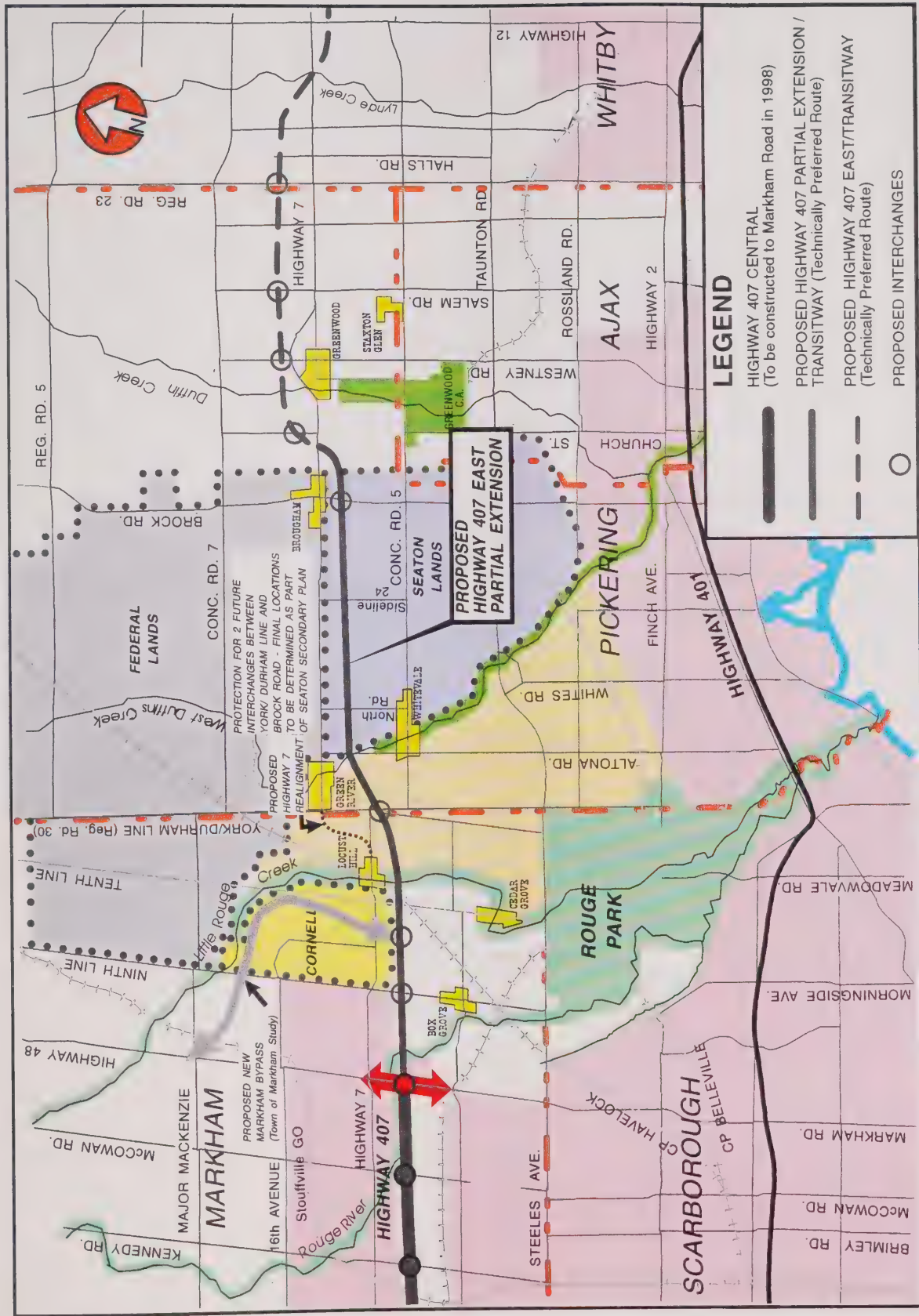
In order to reduce potential traffic impacts through Green River and Whitevale, the extension to Highway 7 east of Brock Road was identified. Because there are no major north-south links in the area between Durham-York Line and Brock Road, and any connection to Highway 7 west of Brock Road would have similar traffic effects on the Village of Brougham, an extension to Brock Road was determined to be the next logical terminus point. Furthermore, in order to minimize future traffic volumes through the Village of Brougham, the extension of Highway 407 was continued easterly to connect to Highway 7 east of Brougham. This connection point is at the location where the technically preferred route identified through the earlier route planning crosses Highway 7. While the community of Greenwood is located further to the east, the community impacts are not considered to be significant because the existing Highway 7 already bypasses the community.

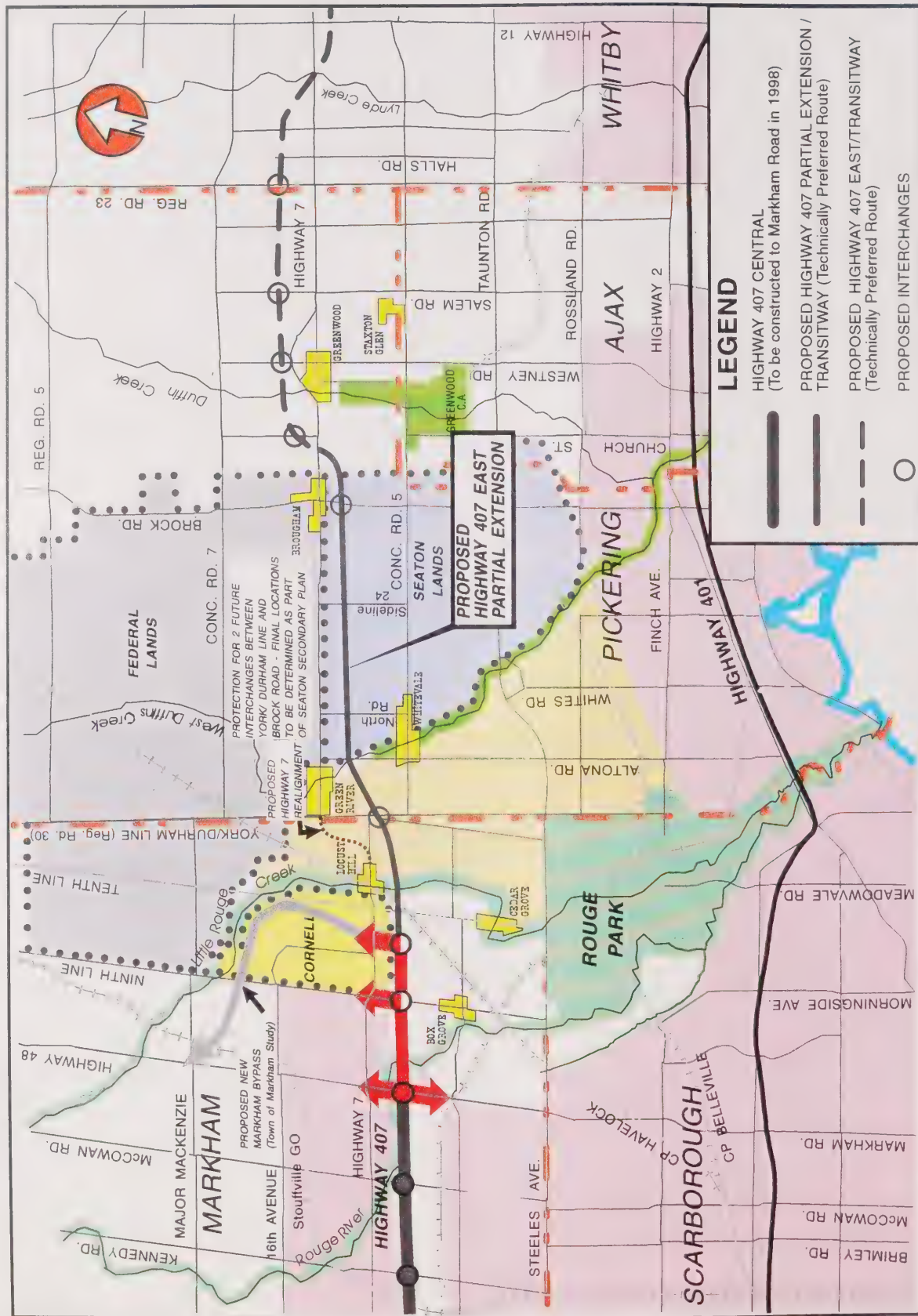
The initial 4 lane freeway would include interchanges permitting north/south movements at Markham Road; north only movements at the 9th Line, and the Markham Bypass; north/south movements at the Durham-York Line (including the Highway 7 relocation, and the Concession 11 connection relocation) and Brock Road, and east/west movements at Highway 7.

5.5.3 Analysis of Alternatives

The benefits and effects of the alternatives were determined using the following criteria:

- **Transportation** - a detailed traffic analysis was carried out as discussed in Chapter 2. Using the future scenario with Highway 407 open to Markham Road as "The Base Case", future traffic increases and decreases were projected for each of the alternatives. Consideration was given to the projected traffic volumes on Highway 407 west of McCowan Road because of the implications for the revenue generating potential of Highway 407. In addition, consideration was given to the implications

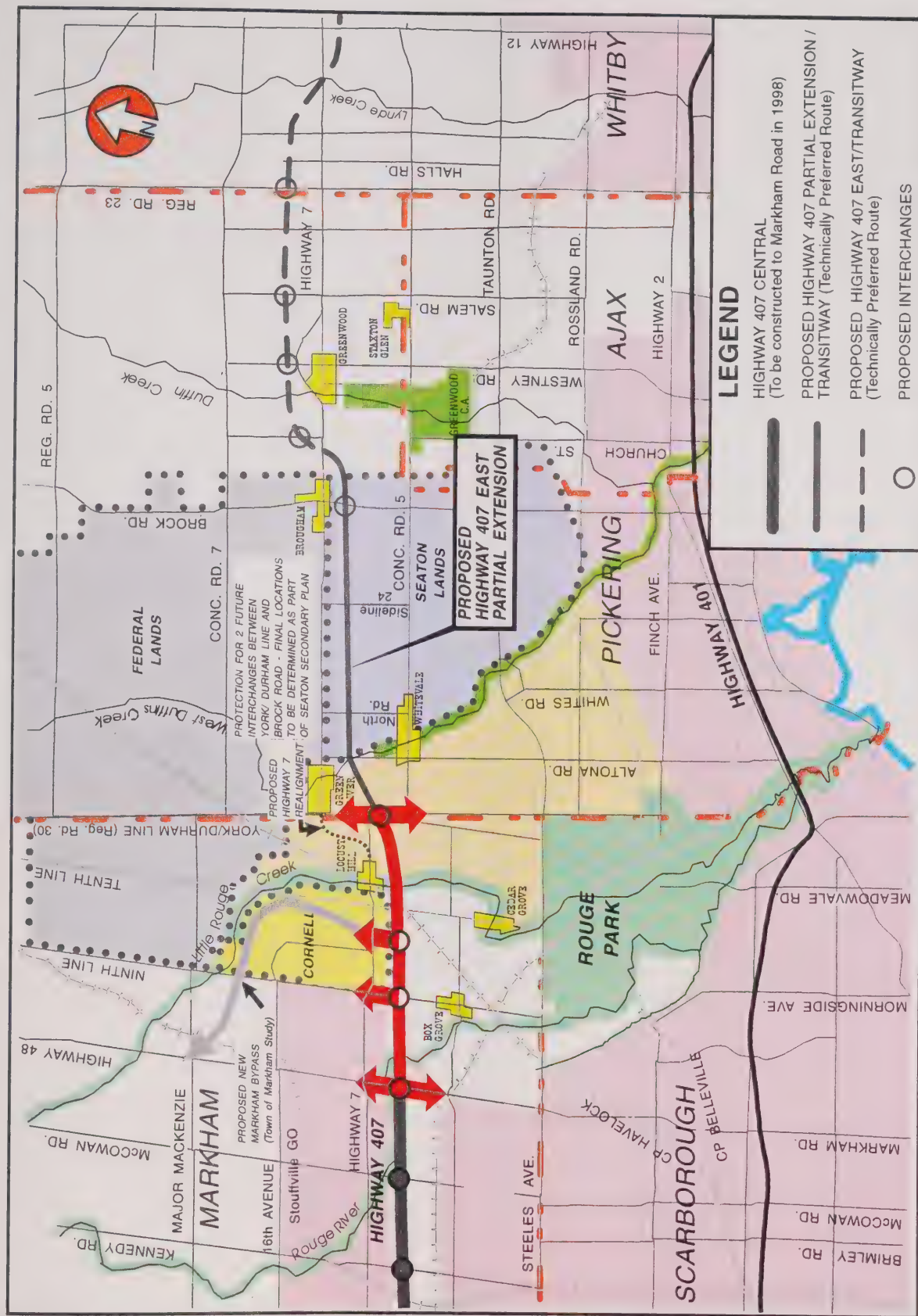


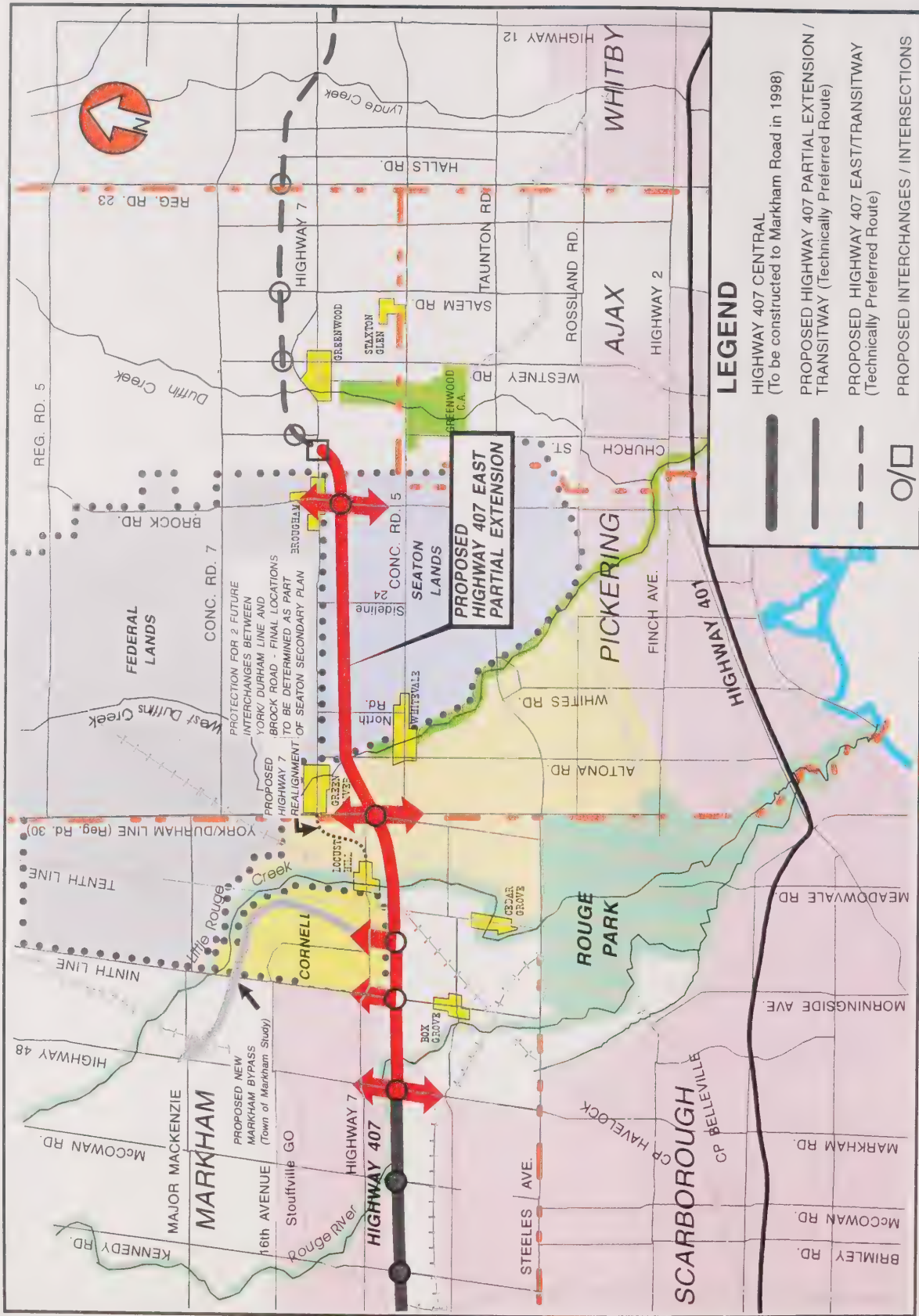


HIGHWAY 407 / TRANSITWAY
MARKHAM ROAD EASTERLY TO
HIGHWAY 7 EAST OF BROCK ROAD

HIGHWAY 407 TO
MARKHAM BY-PASS

EXHIBIT
5.5.2





HIGHWAY 407 / TRANSITWAY
MARKHAM ROAD EASTERLY TO
HIGHWAY 7 EAST OF BROCK ROAD

HIGHWAY 407 TO HIGHWAY 7
EAST OF BROCK ROAD

EXHIBIT
5.5.4

of the alternatives on the transportation network in the study area.

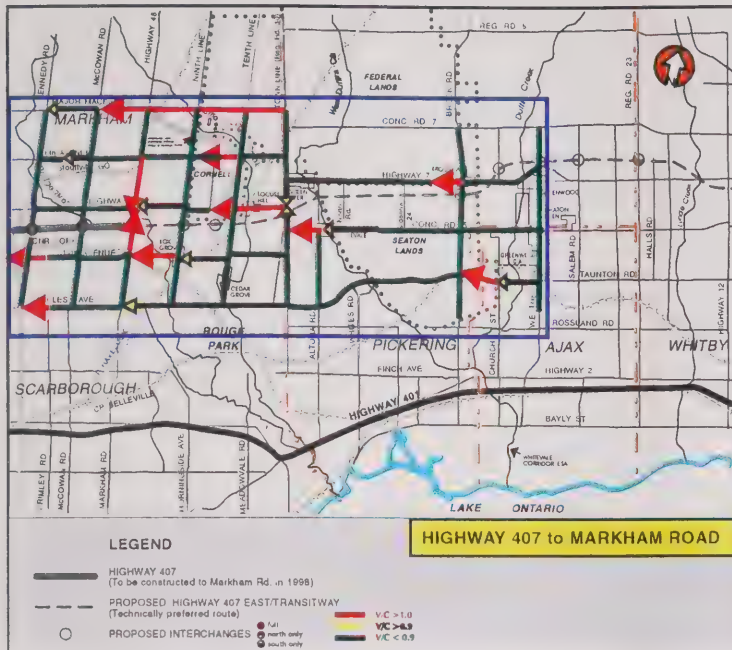
- **Natural Environment** - The 3 extension options follow the technically preferred route identified through the extensive evaluation process discussed previously in this Chapter. Therefore, the comparison of natural environmental effects associated with the 3 staging options were related solely to additional impacts resulting from the advancement of the timing of highway/transitway construction. Although there are significant potential impacts related to the river/valley crossings, these impacts are associated with the facility construction and not the staging of this construction. Therefore environmental impact was not a significant determinant in the evaluation of the partial extension options. The temporary connection at Highway 7 east of Brock Road is the only aspect of the partial extension options not addressed during the Route Planning Phase. Because this connection could be accommodated within the property envelope required for the ultimate facility the impacts would not be significantly different.
- **Social Environment** - the key consideration with respect to the social environment was the effects of the anticipated changes in traffic volumes on the rural hamlets/communities within the study area. Public comments received during the Route Planning Study and municipal staff comments received during the Feasibility Study indicated the desire to limit any increases in traffic through the rural hamlets. The potential impacts on existing communities was a major determining factor in the analysis.
- **Economic Environment** - the various alternatives provide differing degrees of access to existing and future developments including the future Cornell and Seaton communities, and the federal airport lands. Improved and earlier access to these developments was considered to be beneficial, considering that planning studies are underway for each development.
- **Agricultural Impacts** - the relationship of the alternatives to the Duffin Rouge Agricultural Area between the Little Rouge Creek and the West Duffins Creek was the main agricultural consideration. Since the technically preferred route for Highway 407/Transitway crosses the Duffin Rouge Agricultural Area, the potential impacts were not considered to be a determining factor in the analysis.
- **Cultural Environment** - the impacts on heritage buildings and archaeological resources were considered in the evaluation. Again, since the impacts would be associated with the ultimate facility, the advancement of the effects was not considered to be a determining factor in the analysis.
- **Cost/Revenue** - consideration was given to whether or not the options were financially feasible if implemented using a toll system similar to the one planned for Highway 407 west of Markham Road. Since the analysis showed that all

alternatives would have a similar level of financial impact on the proponent, this was not a determining factor in the analysis.

- **Property** - consideration was given to the need to acquire properties not already in Provincial ownership. All of the alternatives require approximately the same amount of private land. The Brock Road alternative requires slightly more private land in the vicinity of the Highway 7 connection.

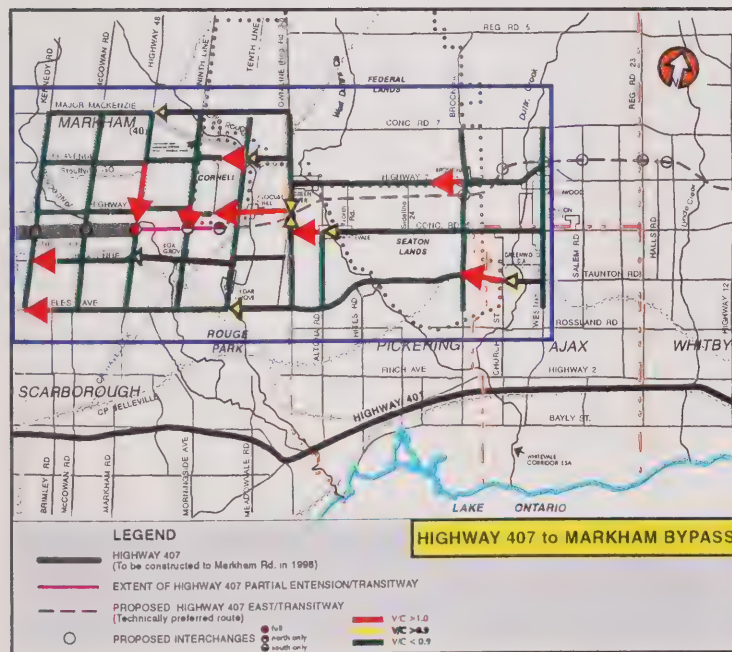
The alternatives were assessed with respect to their implications for increasing traffic volumes on the existing transportation network. The results of this assessment are presented in Exhibits 5.5.5 and 5.5.6. Exhibit 5.5.7 summarizes the other effects of the alternatives.

The results of the assessment were presented to the agencies, the municipalities, special interest groups and the public (see Section 1.7). In summary, the general public identified major concerns about the traffic impacts on the Town of Markham resulting from the termination of Highway 407 at Markham Road, strong support for extending Highway 407 easterly, and concern for protection of the valley systems being crossed by the highway/transitway.



BASE CASE

The Base Case represents the traffic levels with Highway 407 Central opened to Markham Road, and the committed local road improvements in place.



OPTION 98-322 HIGHWAY 407 TO MARKHAM BY-PASS (FOUR LANE FREEWAY - LENGTH 3.425 KM)

Reduced Volume (20%) on Markham Road South of Highway 7 - Southbound

Reduced Volume (15%) on Markham Road North of Highway 7 - Southbound

Reduced Volume (50%) on Highway 7 East of Markham Road - Westbound

Reduced Volumes through Box Grove Community (10%)

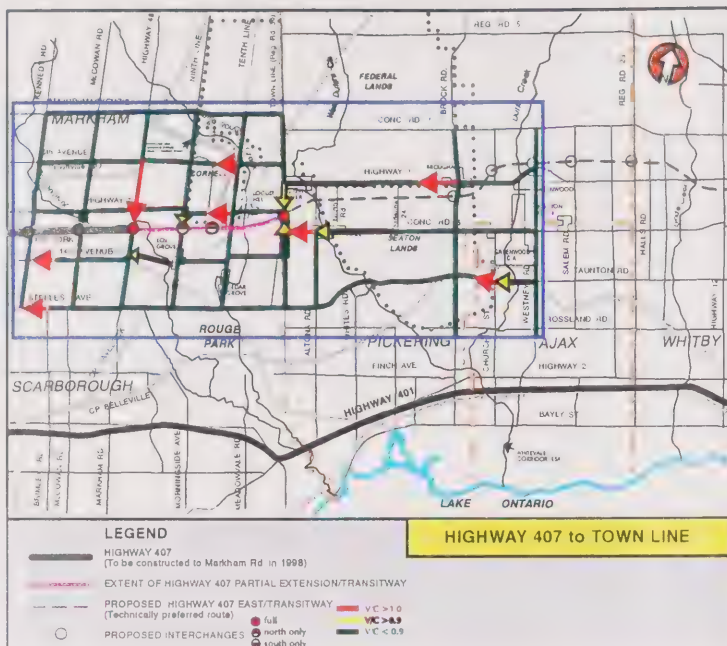
Increased Volume (15%) on Highway 7 West of 10th Line - Westbound

Increased Volume (15%) on Highway 7 East of Road 30 - Westbound

Increased Volume (65%) on 9th Line South of Highway 7 - Southbound

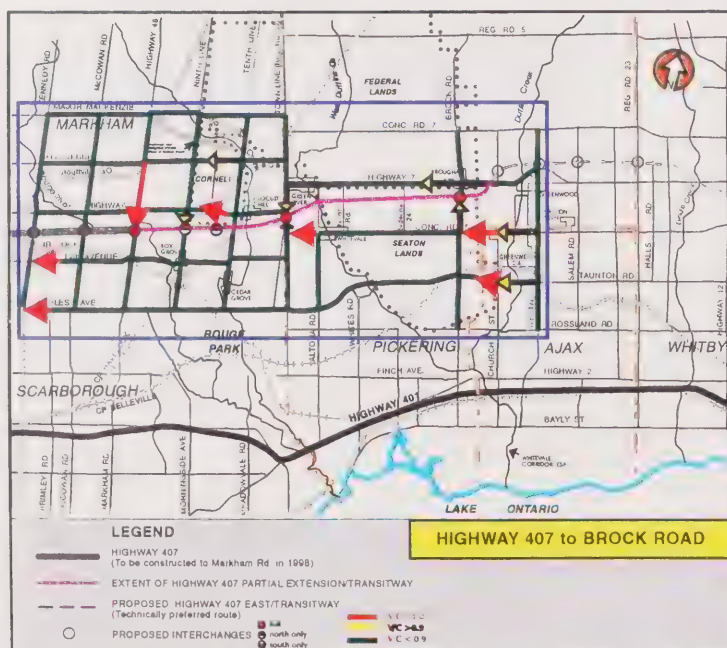
Increased Volumes through Locust Hill (15%), Green River (10%) and Brougham (5-10%)

Increased Volumes through Whitevale (5%)



OPTION 98-342
HIGHWAY 407 TO YORK-DURHAM BOUNDARY (Town Line)
(FOUR LANE FREEWAY - LENGTH 6.5 KM)

- Reduced Volume (25%) on Markham Road South of Highway 7 - Southbound
- Reduced Volume (15%) on Markham Road North of Highway 7 - Southbound
- Reduced Volume (4%) on Highway 7 West of 10th Line - Westbound
- Reduced Volumes through Box Grove (15-35%) and Locust Hill (60%)
- Increased Volume (15%) on Highway 7 East of Road 30 - Westbound
- Increased Volume (20%) on 9th Line South of Highway 7 - Southbound
- Increased Volume (15%) on Highway 7 West of Brock Road - Westbound
- Increased Volumes through Green River (15%) and Brougham (10-15%) and Whitevale (5%)



OPTION 98-353
HIGHWAY 407 TO HIGHWAY 7 EAST OF BROCK ROAD
(FOUR LANE FREEWAY - LENGTH 13.7 KM)

- Reduced Volume (30%) on Markham Road South of Highway 7 - Southbound
- Reduced Volume (20%) on Markham Road North of Highway 7 - Southbound
- Reduced Volume (50%) on Highway 7 East of Markham Road - Westbound
- Reduced Volumes through Box Grove (10-20%), Locust Hill (45%) and Whitevale (5%)
- Reduced Volumes on Highway 7 through Brougham (35%) West of Brock Road
- Increased Volume (30%) on 9th Line South of Highway 7 - Southbound
- Increased Volume (45%) on Highway 7 East of Brock Road - Westbound (Brougham)

	Green River		Whitevale		Locust Hill		Box Grove East		Box Grove West	
	Hwy 7 East of RR30		Conc.5 East of Altona		Hwy 7 East of 10th Line		14th Ave East of Ninth		14th Ave West of Ninth	
	Westbound		Westbound		Westbound		Westbound		Westbound	
407 Terminus at	Increase/Decrease		Increase/Decrease		Increase/Decrease		Increase/Decrease		Increase/Decrease	
	volume [1]	% diff. [2]	volume	% diff.	volume	% diff.	volume	% diff.	volume	% diff.
Markham Road										
Markham By-Pass	85	10%	10	5%	100	15%	40	10%	-100	-10%
York Road 30	125	15%	10	5%	-460	-60%	-170	-35%	-110	-15%
Brock Road/Hwy 7	-40	-5%	-15	-5%	-355	-45%	-45	-10%	-160	-20%

	Brougham East		Brougham West		Greenwood East		Greenwood West	
	Hwy 7 East of Brock		Hwy 7 West of Brock		6th Conc. East of Westney		6th Conc. West of Westney	
	Westbound		Westbound		Westbound		Westbound	
407 Terminus at	Increase/Decrease		Increase/Decrease		Increase/Decrease		Increase/Decrease	
	volume	% diff.	volume	% diff.	volume	% diff.	volume	% diff.
Markham Road								
Markham By-Pass	35	5%					25	25%
York Road 30	70	10%					20	20%
Brock Road/Hwy 7	-280	-45%					220	220%

Note:

Base Condition -Based on 1998 a.m. peak hour volume projections

[1] - Based on 1998 a.m. peak hour volume projections

[2] - % increase/decrease in traffic between Base Condition and extension alternative

	Alternatives			
	To Markham Road	To Markham By-Pass	To Town Line	To Brock Road/Hwy 7
Transportation				
<ul style="list-style-type: none">Projected traffic volumes on Hwy 407 west of McCowan Road (1998 am peak hour)	2400	3300	3600	3700
<ul style="list-style-type: none">Network Impacts (1998 am peak hour)	See Exhibit 5.5.5			
Natural Environment				
<ul style="list-style-type: none">Relationship to major river crossings	-	advances Hwy 407 crossing of: <ul style="list-style-type: none">Rouge River	advances Hwy 407 crossing of: <ul style="list-style-type: none">Rouge RiverLittle Rouge Creek Valley	advances Hwy 407 crossing of: <ul style="list-style-type: none">Rouge RiverLittle Rouge Creek ValleyWest Duffins Creek ValleyTributary of Duffins Creek
<ul style="list-style-type: none">Relationship to woodlots	-	advances impacts to woodlots resulting from Hwy 407 East		
Social Environment				
<ul style="list-style-type: none">Changes to traffic volumes through the community (1998 am peak hour)	See Exhibit 5.5.6			
Economic Environment				
<ul style="list-style-type: none">Access to existing and future development	limited access to existing Markham (Markham Road - 2 lanes)	additional access to existing Markham; advances provision of access to Cornell community	additional access to existing Markham; advances provision of access to Cornell community and limited access to Federal Lands and Seaton	additional access to existing Markham; advances provision of access to Cornell community and limited access to Federal Lands and Seaton
Agriculture				
<ul style="list-style-type: none">Relationship to Duffin-Rouge agricultural uses	-	-	advances impacts on agr. area: <ul style="list-style-type: none">Hwy 407 - 1.6 kmrealigned Hwy 7 - 1.7 km	advances impacts on agr. area: <ul style="list-style-type: none">Hwy 407 - 2.5 kmrealigned Hwy 7 - 1.7 km
Cultural Environment				
<ul style="list-style-type: none">Historic buildings	-	advances removal of 1	advances removal of 2	advances removal of 16
<ul style="list-style-type: none">Archaeology (known sites)	-	0	2	4
Cost/Revenue				
<ul style="list-style-type: none">Financial Viability?	0 (base case)	Yes	Yes	Yes
Property Considerations				
<ul style="list-style-type: none">Relationship to properties owned by Ontario Realty Corporation (ORC)	-	All alternatives required lands not owned by ORC located between Hwy 48 and to the east of 9th Line. Extension to Brock Road/Hwy 7 may require lands not owned by ORC east of Brock Road		

EXHIBIT 5.5.7 ANALYSIS OF PARTIAL EXTENSION ALTERNATIVES

5.5.4 Evaluation and Selection of the Preferred Option

In considering all of the foregoing, the following steps were taken in evaluating the options:

1. the four options were evaluated on the basis of:
 - their effectiveness in addressing the identified traffic concerns;
 - their financial viability;
 - a comparative analysis of environmental effects;
 - their ability to reduce traffic impacts to local communities; and
 - comments/preferences of the review agencies, municipalities and the public.
2. the analysis of interim effects was reviewed
3. those interim effects which are over and above the ultimate effects of future Highway 407 were determined
4. the natural environment, agriculture and cultural effects were screened out for the purposes of evaluating the extension options because these effects will be incurred with the implementation of the ultimate Highway 407/transitway facility. Therefore, the remaining factors that influenced the selection of the preferred extension option were:
 - transportation
 - community effects
 - economic
5. the comments / preferences of the review agencies, municipalities and the public were reviewed for each option
6. a preferred option was determined with a supporting rationale

The comparison of the options for Steps 1 to 5 is summarized in Exhibit 5.5.8. In summary:

- all of the extension options will relieve traffic problems in the vicinity of the planned 1998 termination point of Highway 407 at Markham Road;
- while all of the options appear to be financially viable, there are implications associated with differences in the capital costs;
- the farther east Highway 407 is extended, the greater the reduction in traffic-related impacts on the existing communities; and
- while the extension to the vicinity of Brock Road has the highest capital cost , it best mitigates impacts on the existing hamlets / communities and is supported by the public and municipalities.

	BASE CASE	ALTERNATIVES		
	To Markham Road	To Markham Bypass	To Town Line	To Brock Road / Highway 7
1. DOES THE ALTERNATIVE FULFILL THE STUDY OBJECTIVES? <ul style="list-style-type: none"> Does it provide relief to projected traffic volumes on Markham Road with the opening of Highway 407 to Markham Road? Is it self-financing? 	No	Yes	Yes	Yes
2. WHAT ARE THE INTERIM EFFECTS?	N/A	Yes	Yes	Yes
3. WHAT ARE THE INTERIM EFFECTS WHICH ARE OVER AND ABOVE THE ULTIMATE EFFECTS OF FUTURE HIGHWAY 407? <ul style="list-style-type: none"> Transportation Markham Road - 407 to 7 - 7 to 16th Ave. Local and Provincial Network 	Base Case	-20%	-25%	-30%
	Base Case	-15%	-15%	-20%
	Base Case	Overall reduction west of terminus point. Overall increase east of terminus point.		
<ul style="list-style-type: none"> Communities <ul style="list-style-type: none"> overall projected changes in traffic through the communities projected increase projected decrease no change 	Base Case	Green River Brougham Greenwood	Green River Brougham Greenwood	Greenwood
	Base Case	Box Grove	Box Grove Locust Hill	Whitevale Box Grove Locust Hill Brougham
	Base Case		Whitevale	Green River
4. WHAT ARE THE COMMENTS / PREFERENCES OF: <ul style="list-style-type: none"> Review Agencies Markham / York Pickering / Durham Public 	Addressed as part of Hwy 407 Central	All extensions are acceptable subject to the provision of a high level of mitigation. Number of issues to be addressed increases as Highway 407 extends further east.		
	Strongly Opposed	The extension of Highway 407 to the Markham Bypass as a minimum is strongly preferred.		
	Not Preferred	Not Preferred	Not Preferred	The extension of Hwy 407 to Brock Road as a minimum is strongly preferred.
	Strongly Opposed	The extension of Highway 407 to the Markham Bypass as a minimum is strongly preferred.		

The Project Team concluded that the extension to Highway 7 east of Brock Road was preferred for the following reasons:

- Terminating Highway 407 at Markham Road (i.e. Do Nothing) is not a desirable option because it does not address the significant traffic problems that will be experienced in the Town of Markham and communities east of Markham Road with the opening of Highway 407;
- There is a general desire to extend Highway 407 to the east of Brougham and as soon as possible - this has been identified by the public and provincial and municipal politicians;
- Although this option advances the impacts to the natural and cultural environment and agricultural lands, it reduces projected traffic volumes on Markham Road and within the villages of Green River, Whitevale and Brougham, without significantly increasing the traffic volumes through other communities. The other options did not result in reduced traffic volumes in all of these communities.
- This option is acceptable to the Town of Markham and the Regional Municipality of York because it relieves the future traffic volumes in the Town of Markham, Box Grove and Locust Hill, and supports the Cornell development.
- This option is strongly preferred by the Town of Pickering and the Regional Municipality of Durham because it relieves the future traffic volumes in Green River, Whitevale and Brougham, and supports economic development in the Durham Region.
- There is also general public support for this option because it will reduce traffic volumes in the communities along the route.
- This option crosses several significant watercourses, and concerns have been expressed by regulatory agencies, interest groups and the public. The impacts have been reduced through the development of an alignment through the Route Planning Study that avoids more sensitive environmental features. In addition, bridges are proposed at the major river crossings to further reduce the impacts on vegetation, fisheries and wildlife. Extensive consultation with affected stakeholders during the Feasibility Study resulted in the development of a Stakeholder Consultation Process, which identifies commitments to future work and mitigation of environmental impacts during the design and implementation phase. As well, further public consultation sessions will be held to receive additional input. These commitments are discussed in more detail in Chapter 6. The Draft Stakeholder Consultation Process is included as Appendix 21.

CHAPTER 6

DESCRIPTION OF THE UNDERTAKING AND FUTURE WORK

6.0 DESCRIPTION OF THE UNDERTAKING AND FUTURE WORK

6.1 INTRODUCTION

Chapter 5 of this report documented how the Project Team arrived at its conclusion regarding selection of a Technically Preferred Route for the Highway 407/Transit facility, based on an assessment of reasonable alternatives.

This chapter provides a description of the proposed undertaking, the potential environmental impacts and resultant effects associated with the construction, operation and maintenance of the project, and the future work to be undertaken during the design phase to address environmentally significant areas and issues. Table 6.6.1 at the end of this chapter, provides a Summary of Concerns, Potential Effects, Proposed Mitigating Measures and Commitments to Future Work.

6.2 MAJOR FEATURES OF THE UNDERTAKING

The Technically Preferred Route is illustrated in Plates 1-5. The route is designed to be an ultimate ten-lane freeway with an adjacent transit corridor, with a basic minimum right-of-way of 160m. The route bypasses all existing communities and avoids environmental sensitivities as much as possible, while providing opportune land severance options where possible. The following identifies the major engineering features of the undertaking.

6.2.1 Highway Right-of Way Requirements

The recommended basic minimum right-of-way for the Highway 407/Transitway corridor is 160 m wide: 100 m for the freeway and 60 m for the transitway. This will accommodate an ultimate freeway cross-section consisting of 10 basic lanes with an 8.5 m median (See Exhibit 5.2.1). The 8.5 m median protects for high mast illumination in the median. As discussed in Section 5.2.2, the transitway will be located on the south side of the freeway, with an independent right-of-way, 60 m in width. The right-of-ways incorporate allowances for grading of up to 5 m cut and 5 m fill. Additional property may be required to accommodate mitigation measures such as stormwater management facilities.

Although the approval being sought is for the ultimate 10 lane freeway with the transitway, construction will be phased to respond to traffic demands. Initial construction could consist of 2-3 lanes per direction, plus auxiliary lanes where required. The additional lanes up to the ultimate 10 basic lanes would be added as traffic demands grow and downstream roadway capacity to handle the added traffic is in place.

The highway component includes the following major features:

- 15.9 km of 10 basic lane freeway;
- 7 interchanges;
- grade separations at those crossroad locations that are to remain open;

- 6 bridged watercourse crossings; and
- 1 railway grade separation location.

6.2.2 Transit Right-of-Way Requirements

Engineering standards were researched for a number of transit technologies to establish the critical geometric design criteria and to determine the right-of-way requirements that maintain the most flexibility. The critical geometric design criteria was found to be related to both the Freeway and Conventional Rail modes of travel. Although the technology for the transitway has not been determined at this point, commuter rail design standards have been used to define the horizontal/vertical alignment and right-of-way requirements in order to maintain flexibility in the planning process. Also, options for interim transit on the freeway (ie Freeway/Municipal bus interface at interchanges) and other High Occupancy Vehicle (HOV) initiatives have not been precluded.

Within the subject planning exercise, only the transit alignment and station platforms are protected by the right-of-way shown. The right-of-way protection does not include auxiliary facilities necessary for transit operations, such as the transit station interface with local transit; access to and from local road systems for transit; the size and location of commuter parking facilities; and maintenance and storage yard locations and requirements.

The transit component includes the following major features:

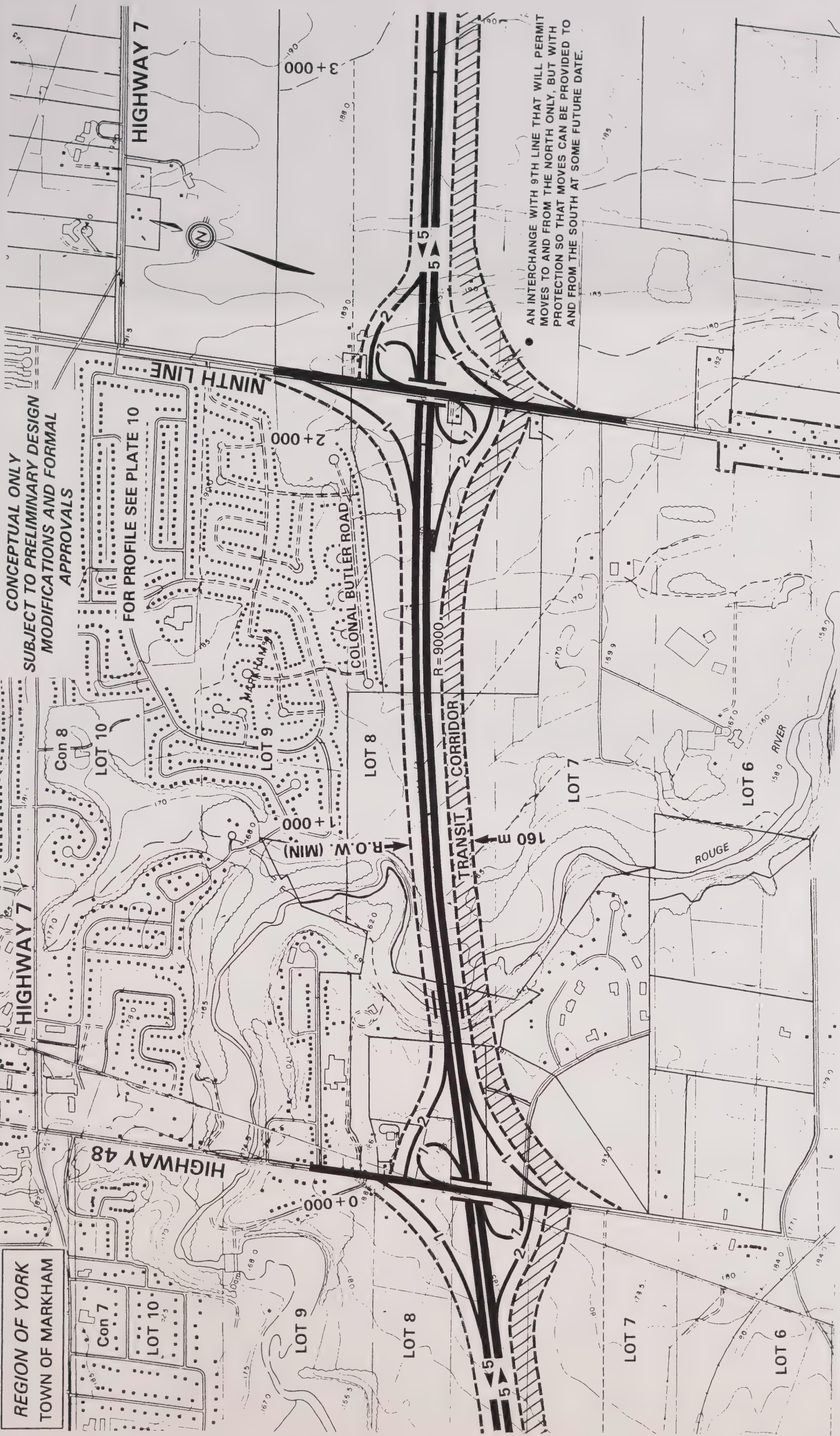
- 15.9 km of transitway;
- grade separations at road crossings;
- 6 bridged watercourse crossings;
- 1 railway grade separation location.

6.2.3 Interchange Locations

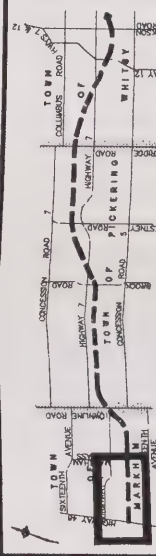
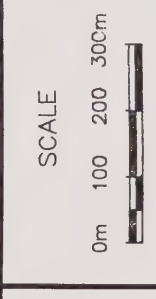
All continuous crossroads which are currently open to the public will be protected for either a grade separation or freeway interchange. A total of 7 interchanges (including the Markham Road interchange) have been provided. Unless otherwise indicated, standard Parclo A-4 interchanges have been protected at the following crossroads:

- | | |
|--|---------------------------------|
| 1. Markham Road | 5. Seaton West Arterial |
| 2. Ninth Line | 6. Seaton East Arterial |
| 3. Markham Bypass (Partial Parclo A) | 7. Brock Road (Regional Road 1) |
| 4. Durham-York Line (Regional Road 30) | 8. Highway 7 (connection) |

The interchange locations between the Durham-York Line and Brock Road are representative only, and will be confirmed in accordance with Seaton Community plans.

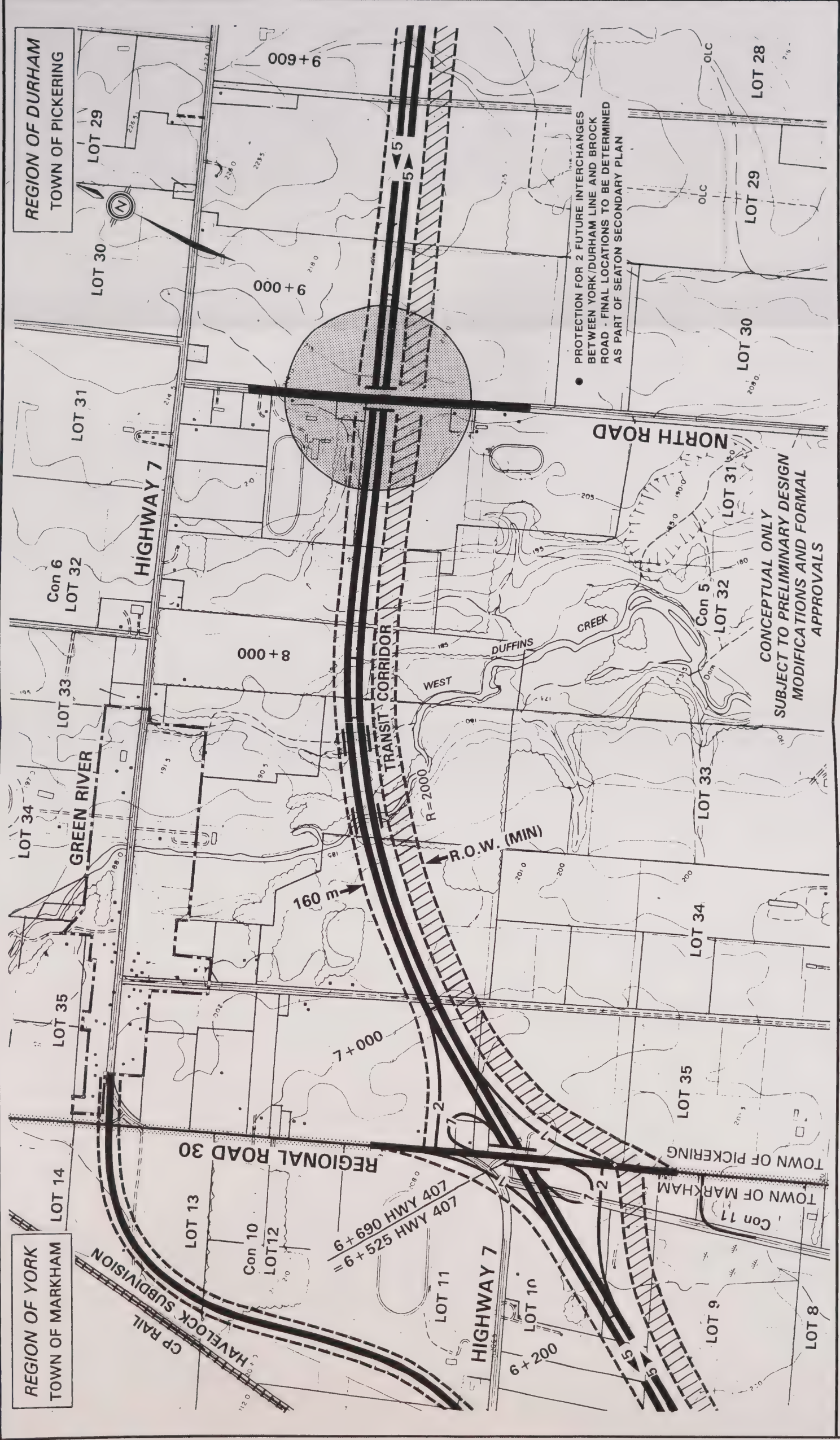


HIGHWAY 407 / TRANSITWAY
MARKHAM ROAD EASTERLY TO
HIGHWAY 7 EAST OF BROCK ROAD

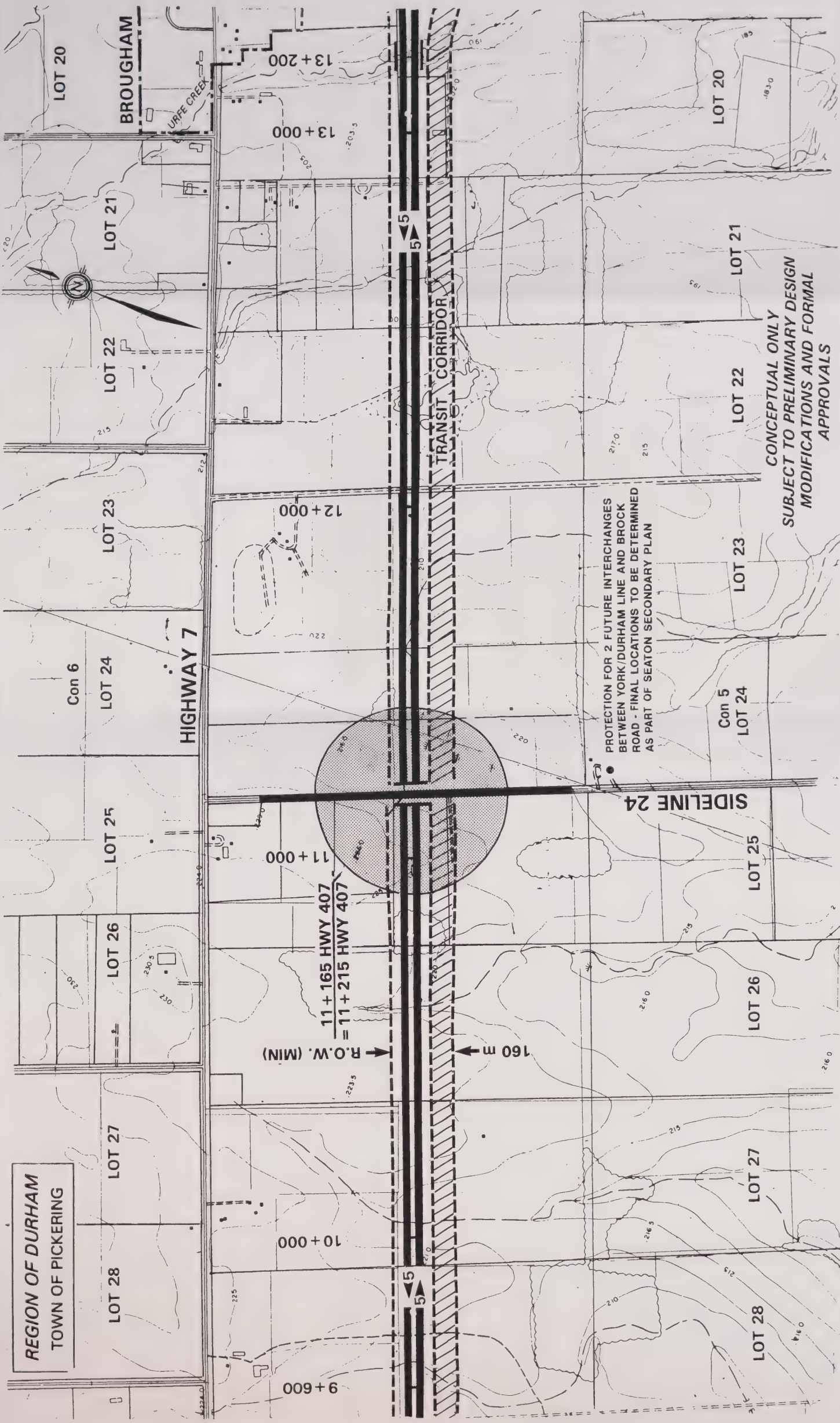


TECHNICALLY PREFERRED ROUTE
CONCEPT PLAN
FROM STA. 0+000 TO STA. 3+000

PLATE
1



<p>HIGHWAY 407 / TRANSITWAY MARKHAM ROAD EASTERLY TO HIGHWAY 7 EAST OF BROCK ROAD</p>	<p>SCALE</p> <p>0m 100 200 300m</p>	<p>TECHNICALLY PREFERRED ROUTE CONCEPT PLAN FROM STA. 6+200 TO STA. 9+600</p>	<p>PLATE 3</p>
--	--	--	----------------------------------



REGION OF DURHAM
TOWN OF PICKERING

LOT 28

LOT 27

LOT 26

LOT 25

LOT 24

LOT 23

LOT 22

LOT 21

LOT 20

BROUGHAM

HIGHWAY 7

TRANSIT CORRIDOR

CONCEPTUAL ONLY
SUBJECT TO PRELIMINARY DESIGN
MODIFICATIONS AND FORMAL
APPROVALS

PROTECTION FOR 2 FUTURE INTERCHANGES
BETWEEN YORK/DURHAM LINE AND BROCK
ROAD - FINAL LOCATIONS TO BE DETERMINED
AS PART OF SEATON SECONDARY PLAN

SIDELINE 24

160 m

11 + 165 HWY 407
= 11 + 215 HWY 407
R.O.W. (MIN)

10 + 000

11 + 000

12 + 000

13 + 000

13 + 200

LOT 28

LOT 27

LOT 26

LOT 25

LOT 24

LOT 23

LOT 22

LOT 21

LOT 20

HIGHWAY 407 / TRANSITWAY
MARKHAM ROAD EASTERLY TO
HIGHWAY 7 EAST OF BROCK ROAD

SCALE



TECHNICALLY PREFERRED ROUTE
CONCEPT PLAN
FROM STA. 9+600 TO STA. 13+200

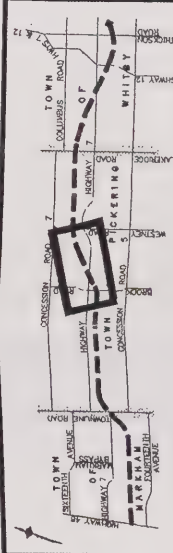
PLATE
4

REGION OF DURHAM
TOWN OF PICKERING



CONCEPTUAL ONLY
SUBJECT TO PRELIMINARY DESIGN
MODIFICATIONS AND FORMAL
APPROVALS

HIGHWAY 407 / TRANSITWAY
MARKHAM ROAD EASTERLY TO
HIGHWAY 7 EAST OF BROCK ROAD



TECHNICALLY PREFERRED ROUTE
CONCEPT PLAN
FROM STA. 13+200 TO STA. 16+600

6.2.4 Adjacent Road System

Highway 7 is proposed to be realigned between Locust Hill and Green River to accommodate an interchange at the Durham-York Line. Consistent with external input received during planning, the realignment has been routed to minimize impacts to a woodlot located between the CP Rail line and Regional Road 30, and to minimize impacts to existing agricultural and commercial operations on lands leased from the province. As well, the Concession 11 connection to the Durham-York Line will be relocated to accommodate the interchange.

6.2.5 Alignment

The horizontal alignment satisfies 120 RFD (Rural Freeway Divided with 120 km/h design speed) standards and, at this preliminary planning stage, has a minimum curve radius of 1,500 m. The minimum radius for 120 RFD is 650 m.

The vertical alignment is proposed to have a maximum grade of 2.0 percent. Intersecting crossroads which require vertical alignment modifications are proposed to have a maximum grade of 6 percent.

Table 6.2.1 provides a detailed description of the technically preferred route along with a discussion of key design controls.

6.2.6 Design Criteria

The following summarizes the design criteria for the freeway that was assumed for planning purposes. These criteria will be reviewed and may be refined during the design phase.

<p>Freeway Design Criteria</p>

<p>Min Design Speed = 120 km/h</p>

<p>R desirable min = 2000 m</p>

<p>Rmin = 1500 m</p>

<p>Kmin = 120</p>

<p>Maximum Grade = 2%</p>

6.2.7 Potential Staging

Implementation of the undertaking will take place over a number of years and reflect financial constraints and traffic/transit demands. It is likely that the implementation of the project will be staged. This staging may include:

- Phasing of the ultimate 10 basic lane highway cross section to respond to traffic demands. Initial construction could consist of 2-3 lanes per direction, plus auxiliary lanes where

required. The additional lanes would be added as traffic demands grow and downstream roadway capacity to handle the added traffic is in place.

- Opening of the highway to traffic as sections become available for use.
- Staging of some interchanges and grade separations with at grade intersections initially.
- Staging of interchange ramps to provide for moves restricted to certain directions initially with others being added when traffic demands/network development warrant.
- Provision of an interim connection at Highway 7 east of Brock Road.
- Construction of a Transitway in a separate corridor adjacent to Highway 407.

6.3 STAKEHOLDER CONSULTATION DURING THE DESIGN PHASE

The following discusses the actions to be taken during the design phase to address design and environmental issues.

6.3.1 Stakeholder Participation

The MTO recognizes the sensitivities associated with the crossing of the major and minor watercourses in the study area, the need to minimize impacts to ecological systems, the need to mitigate impacts to heritage resources, and the need to mitigate noise impacts. Therefore, the MTO is committed to involving affected stakeholders in the design process to ensure that the Highway/Transitway is designed and constructed in a way that is responsive to these stakeholders' interests.

Since the design has not commenced, there is ample opportunity for meaningful stakeholder input. The following sets out the proposed consultation process.

The Technical Advisory Contacts

To ensure that the design process proceeds efficiently while ensuring that it is responsive to the goals of the affected agencies, the Ministry will require that the Highway 407/Transitway design team meet with the affected agencies and municipalities. A representative from each of the affected agencies/municipalities who can make decisions on behalf of their organization will be consulted. The purpose of this consultation is to provide a forum through which environmentally related design, construction, maintenance and operation issues can be identified, discussed and resolved on an ongoing basis throughout the design and construction phase. Experience shows that this is a highly efficient and effective mechanism for ensuring that agency interests are properly addressed in the design and construction of the facility. In addition, these agencies have the mandated

goals of environmental protection, thus ensuring that these goals are properly accounted for during the design. It will also ensure that new information collected through other studies is considered in the decision-making process.

Attendance at these meetings will change depending upon the issues being addressed. However, because of the number of areas of interest to MNR and MTRC, these agencies will be involved in most meetings. They will also be copied on minutes of other relevant meetings. When addressing relevant issues within the Rouge Watershed, a representative of the Rouge Park Alliance will be invited to the meetings. Similarly, when addressing fishery compensation issues or navigation issues the Department of Fisheries and Oceans will be invited, and when addressing issues relating to the railway crossing, a representative of the Canadian Transportation Agency will be invited. All agencies will be able to become involved when their mandated areas of interest are affected.

The design team will meet with the technical advisory contacts on a regular basis during the design phase. Meetings may be held on-site as necessary to facilitate discussions. In addition, the technical advisory group will be consulted during the construction phase as issues arise that need discussion and resolution. A schedule of meetings will be established at the outset of consultation to ensure that stakeholders can effectively schedule their participation, and all meetings will be documented.

The External Group

The external group consists of the technical agencies having expressed an interest in ongoing involvement with the Highway 407/Transitway project. They have been involved throughout the planning of this project and will continue to be kept informed of the progress of the design and construction phases through correspondence and meetings as issues that are relevant to specific agency mandated concerns arise. Specific contact will be made near the beginning and towards the end of the design phase. Additional contacts will be made as required to resolve any issues.

Municipal Involvement

Throughout the planning of this undertaking municipal staff and elected officials have been involved. During the design and construction phases municipal staff will be consulted on an ongoing basis as issues arise. In addition, as necessary, presentations will be made to municipal councils.

Public Consultation

The public has been kept informed of the progress of the Highway 407 studies and influenced the planning of the undertaking. In order to keep the public informed through the design phase and to allow for public input, two public consultation sessions will be

held during the design phase. In addition, public notification of the commencement of construction will be provided.

6.3.2 The Design Process

The design is usually carried out in two phases - preliminary design and detailed design. These two phases have traditionally followed one after the other. Because of the intention to accelerate the design and construction of Highway 407, the preliminary design and detailed design phases may be combined as an evolving process. It is likely that components of the undertaking will be at different stages in the design and construction process. Since construction may occur over several years, design of the portion of the undertaking that will be constructed in a subsequent year may be done while previous portions are being constructed.

Environmental Protection Objectives

Although the specific objectives for protecting the environment will be determined during the design phase in consultation with external agencies and municipalities, Section 6.4 sets out objectives that address issues that have been identified thus far during the consultation process for this project. These have been developed in consultation with affected agencies.

Design

Early in the design phase, the design concepts are developed - addressing issues such as general arrangement, structure types, spans, clearances, pier placement, site access, vertical and horizontal grades, interchange placement and configuration, and preliminary stormwater management plans. In addition, during this phase property acquisition and archaeological and built heritage mitigation activities will be started, and geotechnical surveys will be carried out.

At the start of the design of each watercourse crossing, meetings will be held to discuss each agencies' objectives with respect to the crossings. To facilitate these discussions, the table provided in Table 6.3.1 will be completed for each crossing. This step is critical to ensuring that the design team and stakeholders have a common understanding of the issues, constraints and goals to be addressed by the design. The information to be considered includes: stream habitat classification and type at the crossing locations; MNR habitat sensitivity level for fish at the crossing; system sensitivity downstream of the crossing location; stormwater management sensitivities at the crossing (including storage and passage of flood flows, water quality and erosion control); other environmental conditions (e.g. terrestrial habitat and corridors, groundwater conditions, public access, and ESA features and functions); and engineering design constraints.

WATERSHED:																									
Structure No. (Crossing No.)	Structure Type & Dimensions	Segment Number	Watercourse Name	Stream Class	Stream Habitat Classification at Crossing	MNR Criteria Habitat Type at Crossing	MNR Habitat Sensitivity Level For Fish, at Crossing			System Sensitivity Downstream of Crossing			SWM Sensitivity at Crossing			Other Environmental Issues at Crossing	Engineering/ Design Constraints								
					W	C	CM	1	2	3	H	M	L	Comments	1	2	3	Comments							
The analysis of sensitivity will be guided by these documents. —————>														MNR Habitat Manual		To be determined		To be determined		To be determined		To be determined			
														Temperature Regime Analysis											
														W Warmwater											
														C Coldwater											
														CM Coldwater-Migratory											
														Stream Classification Codes											
														PU =Permanent Urban											
														DS =Drainage Swale											
														IA =Intermittent Agriculture											
														IU =Intermittent Urban											
														IN =Intermittent Natural											
														PN =Permanent Natural											

Note: Other Environmental Issues include but are not limited to: terrestrial habitat and corridors, groundwater conditions, public access, and ESA features and functions.

TABLE 6.3.1
SUMMARY OF WATERCOURSE SENSITIVITY

Alternative design concepts will be developed and evaluated on the basis of issues including environmental impacts, ability to mitigate environmental effects, transportation objectives, engineering requirements, constructability, and cost. A preferred design concept will be developed/refined in consultation with the stakeholders.

During this phase, initial mitigating measures and fishery habitat compensation plans (where required) will be developed in consultation with stakeholders. As well, the need for, and nature of follow-up monitoring will be determined in consultation with MNR, MTRC, MOEE, RPA, DFO and DOE. Again, ongoing consultation will ensure that, as the details of the design are refined, agency concerns continue to be addressed.

6.3.3 Documentation of the Design Phase

When the design of a component of the undertaking has been completed, the specific commitments to environmental protection measures, ongoing consultation and follow-up monitoring will be documented in a "Design and Construction Report" and made available to the stakeholders for review and comment prior to the commencement of construction.

6.3.4 Construction Phase

Prior to construction, construction plans will be prepared to ensure that construction is carried out in accordance with the agreements reached during the design phase. This includes the implementation of environmental protection measures, restoration and/or compensation plans. Copies of construction plans will be made available to stakeholders for review and comment, prior to commencement of construction.

6.3.5 The Canadian Environmental Assessment Act

The Canadian Environmental Assessment Act (CEAA) requires that a CEAA approval be obtained for those projects requiring federal lands, federal funding, or specified federal approvals. The Highway 407 project is expected to trigger CEAA because of three types of federal approvals. The review carried out under CEAA will be a Screening of the environmental affects, including cumulative effects, associated with the specific activities that trigger the Act.

During the design phase application will be made for federal approvals under the Navigable Waters Protection Act (NWPA) for the Rouge River Crossing, and potentially the Canadian Transportation Act (CTA) for the crossing of CPR's Havelock Subdivision. Where required, these applications will be accompanied by suitable environmental and design reports that provide the necessary environmental information to conduct a screening under the Canadian Environmental Assessment Act (CEAA). In addition, where it is determined by the MNR that harmful alteration of fish habitat will occur, authorization under the Federal Fisheries Act will be required. Issuance of this authorization also triggers CEAA. The potential Federal Approvals include the following:

The Crossing of the CPR Line

A crossing of the CPR Havelock Subdivision will be required. This rail line has 1 track diagonally crossing the corridor in the vicinity of Locust Hill in Lot 8, Concession 10 in the Regional Municipality of York (4859600N, 644350E). The crossing location is surrounded by agricultural land. There is a shrub hedgerow on both sides of the rail line. These hedgerows have little corridor value and no rare vascular plants or significant wildlife were observed or expected in this area. To the west of the railway is an agricultural swale with a shrub hedgerow consisting of apple, hawthorn and small white elm scattered in a typical old-field matrix. This unit has low corridor value and no rare vascular plants or significant wildlife were observed or are expected. To the east is the Little Rouge Creek. For the purposes of the Canadian Transportation Act approval, the structure that is required to cross the Little Rouge Creek is separate from the railway crossing, and will not be part of the Canadian Transportation Agency (CTA) approval.

Where an agreement can be reached with the CPR, no approval decision by the CTA is required, and therefore there is no CEAA trigger. If however, an agreement cannot be reached, a decision will be required from the Canadian Transportation Agency. The requirement for this authorization triggers a CEAA Screening. Because the CEAA Screening cannot be done until a request for An Order to Construct is made, and because the request for the Order must contain design information, the actual CEAA screening must wait until the design information can be provided. The CTA can do a screening and issue a preliminary Order to Construct on the condition that more detailed design information is provided for their approval before construction begins. Therefore, a design and construction report may need to accompany the application for An Order to Construct, addressing the specific environmental assessment requirements as specified in the CTA's Environmental Assessment Guide.

The Crossing of the Rouge River - NWPA

The Canadian Coast Guard has determined that the Rouge River is the only navigable waterway affected by the undertaking. This crossing will require an authorization under the Navigable Waters Protection Act. This authorization is a trigger under CEAA and therefore a CEAA Screening will be required. The Canadian Coast Guard will be the Lead Responsible Authority for this screening. At the time of application for a NWPA approval, design and environmental impact and mitigation information will be provided so that both a CEAA Screening and the issuance of the NWPA Approval can be done.

Department of Fisheries and Oceans

Under the Fisheries Protocol signed between the MTO and the MNR, the first point of contact to address fisheries issues is with the MNR. It is only in those situations where MNR concludes that harmful alteration of fish habitat will occur, that an authorization from the Department of Fisheries and Oceans (DFO) is required. Upon referral of a water

crossing project to DFO for Authorization under the Fisheries Act, DFO will determine if an Authorization may be issued on the basis of the information provided and the mitigation and compensation measures proposed. Once a decision to issue an Authorization is made, the requirement for a CEAA screening is triggered. A detailed assessment of the stream crossings will be carried out during the design phase of the study. This analysis will be presented in a supplemental report that will be submitted with a joint proponent/MNR letter of intent, to DFO in support of the request for Authorization and the CEAA Screening. This report will be prepared in consultation with MNR, MTRC, DFO and DOE and will address the detailed impact and mitigation measures, including any required mitigation and fisheries compensation.

6.4 ENVIRONMENTAL ISSUES AND COMMITMENTS

Exhibit 6.4.1 shows the Technically Preferred Route and the natural features affected. These features are summarized in Table 6.4.1. A more detailed description of the fisheries is provided in Appendix 19, and a more detailed description of the terrestrial resources is provided in Appendix 20.

The following provides a brief description of the significant effects of the undertaking and sets out objectives for the design and construction phases of the undertaking to address the key environmental concerns raised during the study. When reading these objectives, the following short forms apply.

DFO - Department of Fisheries and Oceans
CCG - Canadian Coast Guard (part of DFO)
F&HM - Fisheries and Habitat Management (part of DFO)
DOE - Department of the Environment
CTA - Canadian Transportation Agency
MTO - Ministry of Transportation of Ontario
MOEE - Ministry of Environment and Energy (Ontario)
MNR - Ministry of Natural Resources (Ontario)
MCzCR - Ministry of Citizenship, Culture and Recreation.
MTRC - Metropolitan Toronto Region Conservation Authority
RPA - Rouge Park Alliance
CPR - Canadian Pacific Railway
NWPA - Navigable Waters Protection Act
CEAA - Canadian Environmental Assessment Act

Table 6.4.1

Summary of Terrestrial and Aquatic Environment Potentially Affected by the Undertaking

This Table summarizes the terrestrial and aquatic information contained within Appendices 18 and 19. The following shortforms have been used in the charts.

Ab	Black Ash	Do	Dogwood
Ag	Red Ash	Ea	White Elm
Ap	Apple	Ha	Hawthorn
At	Trembling Aspen	He	Hemlock
Aw	White Ash	Id	Ironwood
Bd	Basswood	Le	European Larch
Be	Beech	Mh	Sugar Maple
Bn	Butternut	Mm	Manitoba Maple
Bw	White Birch	Or	Red Oak
By	Yellow Birch	Pb	Balsam Poplar
Cb	Black Cherry	Pw	White Pine
Cho	Choke Cherry	Sw	White Spruce
Cw	White Cedar	Wi	Willow
		P.Sig	Provincially Significant

NOTE:

The following Table summarizes Terrestrial and Aquatic information collected during the Route Planning Phase, and the 1996 Fisheries Inventory Study. The information presented on the Tables are field data only and will be given more detailed consideration during the consultation process to be followed during the design and construction phase as outlined in Section 6.3. The fish species information provided includes species identified in the system based on the 1995 aquatic studies, and the species identified at the proposed crossing locations during the 1996 Fisheries Inventory Study. The corridor value conclusions are based upon the 1995 terrestrial studies and would be considered further during the design phase as part of the Stakeholder Consultation Process. For specific detail, reference should be made to the text of the appendices.

RIVER/CREEK NAME	STREAM NUMBER	FISHERY/ SIGNIFICANCE	FISH SPECIES	VEGETATION UNIT NUMBER	VEGETATION SIGNIFICANCE/ DISCUSSION	WILDLIFE	CORRIDOR VALUE
ROUGE RIVER (Bridge)	AL1900	Coldwater with Migratory and Resident Salmonids/ High Significance	System: rainbow trout, white sucker, brassy minnow, common shiner, bluntnose minnow, blacknose dace, longnose dace, creek chub, rock bass, johnny darter Crossing: rainbow trout, rock bass, white sucker, cyprinids	TA1810 - TA1813	High Significance Deep valley. Steep unstable west slope. Dense shore and stream edge. West-deciduous tree species (Mh,Aw) Linear wetland (Cw, Mm, Ag) East bank - Wi, Ce, Mh, Aw	P.Sig. Carolina Wren 500-1000m N - 27 species breeding birds - deer, beaver - blue heron, spotted sandpiper, pileated woodpecker P.Sig. Smokey shrew may be present - american toad	High
N/A	N/A	N/A	N/A	TA1805	Low Significance TA1805 - Artificial shrubland (Ap,Ha) Some Aw, Ea, Or - associated with old IBM Golf Course.	No rare of significant wildlife.	Low
UNNAMED Tributary to the Rouge River	AL1794	Warmwater Intermittent/ Low Significance	None	None	None	None	None
N/A	N/A	N/A	N/A	TA1793	Low Significance TA1793-Old residential and farm vegetation	No significant wildlife observed.	Low
UNNAMED Tributary to the Little Rouge Creek	AL1780	Warmwater Intermittent/ Low Significance	None	TA1790- TA1792	Low Significance TA1790-Old field/shrubland along drainage ditch - (Wi, Ha, Cho, Mm) TA1791-along drainage ditch (Wi, Mm) TA1792-Wetland along agricultural ditch. (Willow shrubs, cattails, bulrush, reed canary grass)	No rare or significant wildlife Deer, migratory song birds No significant wildlife Deer use area, Migratory birds No significant wildlife	Low Low Low

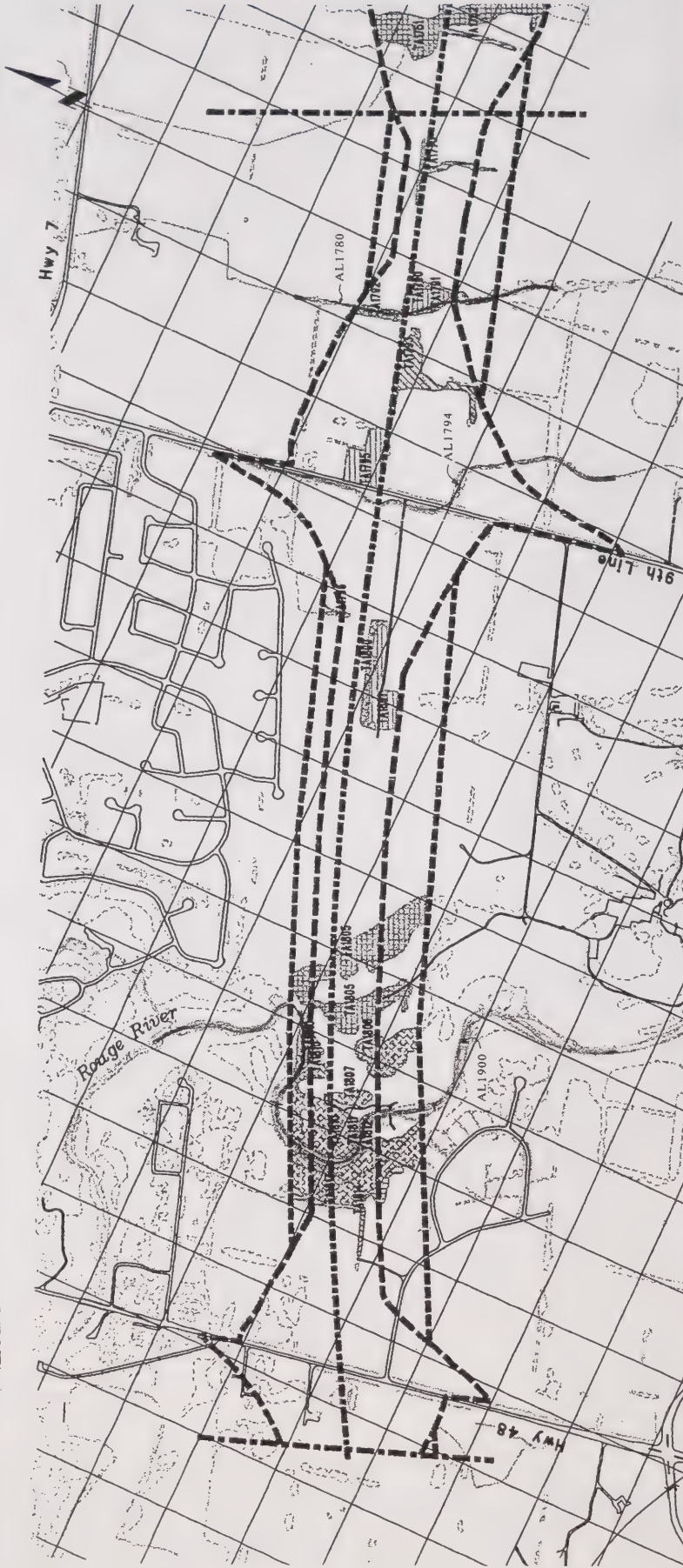
RIVER/CREEK NAME	STREAM NUMBER	FISHERY/ SIGNIFICANCE	FISH SPECIES	VEGETATION UNIT NUMBER	VEGETATION SIGNIFICANCE/ DISCUSSION	WILDLIFE	CORRIDOR VALUE
UNNAMED Tributary to the Little Rouge Creek	AL1760	Warmwater Intermittent/ Low Significance	None	TA1751- TA1752	Low Significance TA1751- moist extension of large woodlot to North (Ea, Aw, Wi, Do) TA1752-Hedgerow	-redtailed hawk, woodcock, deer.	Low
UNNAMED Tributary to the Little Rouge Creek	AL1761	Warmwater Intermittent/ Low Significance	None	TA1740	Low Significance Wetland- drains to TA1751. (Wi, Mm, Do, Sedges)	Deer use area	Low
UNNAMED Tributary to the Little Rouge Creek	AL1720	Warmwater Intermittent/ Low Significance	None	TA1730	Low Significance Small woodlot (Ash, Wi)	No significant wildlife	Low
UNNAMED Tributary to the Little Rouge Creek	AL1719	Warmwater Intermittent/ Low Significance	None	TA1715	Low Significance Hedgerow- Ap, Ha, Ea	No significant wildlife	Low
CPR CROSSING (Bridge)	N/A	None	None	TA1714	Low Significance Hedgerow-	No significant wildlife	Low
LITTLE ROUGE (Bridge)	AL1700	Potential coldwater.- Slow moving, soft, silty sediments Migratory Salmonids/ High Significance	System: rainbow trout, white sucker, honeyhead chub, common shiner, fathead minnow, blacknose dace, longnose dace, creek chub, central stoneroller, brown bullhead, stonecat, rock bass, pumpkinseed, smallmouth bass, rainbow darter, Iowa darter, johnny darter Crossing: rainbow trout, basses, central stoneroller.	TA1711- TA1712	High Significance TA1711-East bank-gently sloping(Cw,Mh,Aw,Id) High floristic diversity. TA1712-West Steep bank-mixed conif/ decid. (Aw, Cw, Bd, Ea, Pb) Includes open floodplain	Wood frog, American toad, Redbacked salamander N of CPR. No significant wildlife - 50 breeding birds Deer P.Sig. Smokey shrew may be present.	High
UNNAMED Tributary of Petticoat Creek	AL1673	Agricultural swale / Low Significance	None	TA1690- TA1691	Low Significance Hardwood hedgerows-no rare plants	No significant wildlife	Some local corridor value- isolated

RIVER/CREEK NAME	STREAM NUMBER	FISHERY/ SIGNIFICANCE	FISH SPECIES	VEGETATION UNIT NUMBER	VEGETATION SIGNIFICANCE/ DISCUSSION	WILDLIFE	CORRIDOR VALUE
UNNAMED Tributary of Petticoat Creek	AL1672	Agricultural swale / Low Significance	None	None	None	None	None
UNNAMED Tributary of Petticoat Creek	AL1671	Agricultural swale / Low Significance	None	None	None	None	None
N/A	N/A	N/A	N/A	TA1680	Low Significance Plantation - Sw(55%), Pr(15%), Pw(25%) and some Mh, Mm, At.	Poor wildlife habitat	Low
PETTICOAT CREEK	AL1670	Warmwater Intermittent/ Low Significance	None	TA1671	Low Significance Oldfield	No significant wildlife	None
UNNAMED Tributary of Petticoat Creek	AL1652	Agricultural swale / Low Significance	None	TA1653	Low Significance Oldfield	No significant wildlife	None
UNNAMED Tributary to West Duffins Creek (Bridge)	AL1631	Coldwater Fishery/ High Significance	System: brook trout, white sucker, fathead minnow, blacknose dace, longnose dace, creek chub, brook stickleback, pumpkinseed, johnny darter Crossing: brook trout, pumpkinseed, white sucker, darters, minnows	TA1640	See below	See below	Important corridor See below

RIVER/CREEK NAME	STREAM NUMBER	FISHERY/ SIGNIFICANCE	FISH SPECIES	VEGETATION UNIT NUMBER	VEGETATION SIGNIFICANCE/ DISCUSSION	WILDLIFE	CORRIDOR VALUE
WEST DUFFINS CREEK (Bridge)	AL1630	Warmwater Fishery with Migratory Salmonids/ High Significance	System: white sucker, common shiner, fathead minnow, blacknose dace, longnose dace, creek chub, pumpkinseed, rainbow darter, johnny darter, mottled sculpin Crossing: white sucker, pumpkinseed, mottled sculpin	TA1640-1642	High Significance TA1640-Mixed woodland, meadow & floodplain east of creek. Cw, Bd, Ea, Ph, Mh, He, Aw, Mm. TA1641-Moderately sloping west bank TA1642-oldfield	No significant wildlife - 36 bird species, deer signs (winter habitat)	High
UNNAMED Tributary to Duffins Creek	AL1610 AL1611	Intermittent/ Low Significance	None	TA1620 TA1600	Low Significance Oldfield-occasional small wet area with cattails (Ha, Ap, Ea) Mixed woodland (Mh, Mm, Be, Aw, Pw)	None Habitat for songbird	Low Some local.
UNNAMED Tributary to Duffins Creek	AL1580	Agricultural swale/ Low Significance	None	None	None	None	None
UNNAMED Tributary to Duffins Creek	AL1570	Agricultural swale/ Low Significance	None	None	None	None	None
GANETSEKIAGON	AL1560	Intermittent/ Low Significance	None	None	None	None	None
N/A	N/A	N/A	N/A	TA1550	Low Significance .8ha mature upland forest (Mh 95%)	No rare wildlife - deer use in summer	Low
N/A	N/A	N/A	N/A	TA1530	Moderate significance 5.5 ha unclassified wetland.	No wildlife observed but amphibians can be expected	Moderate

RIVER/CREEK NAME	STREAM NUMBER	FISHERY/ SIGNIFICANCE	FISH SPECIES	VEGETATION UNIT NUMBER	VEGETATION SIGNIFICANCE/ DISCUSSION	WILDLIFE	CORRIDOR VALUE
UNNAMED Tributary to the Ganetsekiagon	AL1510	Intermittent/ Low Significance	None	TA1501-j1502	Moderate Significance TA1501-mixed aged woodland. 90% Mm, Aw, Ea. TA1502-hardwood hedgerow.	No rare wildlife Northern oriole, woodcock, Canada Goose, yellow warbler, yellow throat. No significant wildlife	Moderate Low
UNNAMED Tributary to Urfe Creek	AL1470	Seasonal Warmwater Baitfish/ Seasonally Moderate Significance	Crossing: brook stickleback, fathead minnows	TA1480-1484	Moderate Significance TA1480-Diverse shrubland/ woodland- black locust, small wetland, Wi, Do, Cw, Bn TA1481-large block of white cedar-only .7ha affected. TA1482-Mixed woodland- Ab, Wi, Mm, Cw, Ea, TA1483-Mixed woodland- Cw, Mh TA1484-Quarry has become a wetland. Small trees & shrubs. Pb, Mm, Ea, Wi, Do.	No significant wildlife - deer, ruffed grouse, ovenbird. No rare wildlife No significant wildlife-deer, ruffed grouse No significant wildlife. No significant terrestrial vertebrates. Breeding area for herpetofauna	Moderate Part of E-W corridor.
URFE CREEK (Bridge)	AL1460	Seasonal Warmwater Baitfish/ Seasonally Moderate Significance	Crossing: fathead minnow, blacknose dace, creek chub	TA1450	Moderate Significance Moderately steep sloped valley. Mixed forest cover. 20% Aw- 15% each of Wi, Mh, Or, Pw - rest is Bd, Cb, Bw, By, Be. Lower canopy = Cw, Ea, Be. Floodplain = Wi High diversity-no rare plants	No significant wildlife Deer signs.	Moderate Probably a deer corridor but not wintering area.

RIVER/CREEK NAME	STREAM NUMBER	FISHERY/ SIGNIFICANCE	FISH SPECIES	VEGETATION UNIT NUMBER	VEGETATION SIGNIFICANCE/ DISCUSSION	WILDLIFE	CORRIDOR VALUE
BROUGHAM CREEK	AL1420	Intermittent/ Low Significance	None	TA1410	Moderately Significant Moderately sloping valley banks. 30% Aw, 30% Aspen, 10% Pw, 15% ironwood 10% Mh- high floristic diversity- no rare plants	None observed. Habitat is suitable for a variety of wildlife.	Moderate
SPRING CREEK	AL1400	Intermittent/ Low Significance	None	TA1390	Low Significance Old field/ shrubland- widely spaced individual Ea, buckthorn, Ap. No rare plants.	No significant wildlife	Low
UNNAMED Tributary to Brougham Creek (Bridge)	AL1380	Coldwater/ High Significance	System: brook trout, white sucker, northern redbelly dace, bluntnose minnow, blacknose dace, mottled sculpin Crossing: white sucker, mottled sculpin, minnows	TA1370	High Significance Mixed forest- Gently sloping west bank-contains major discharge area. 70% Cw, Pb, Bw, Aw, Ea, By, He. Very high diversity. No rare plants.	No significant wildlife observed. Habitat present.	Moderate Part of Duffin Creek corridor. Value diminished by Hwy 7.



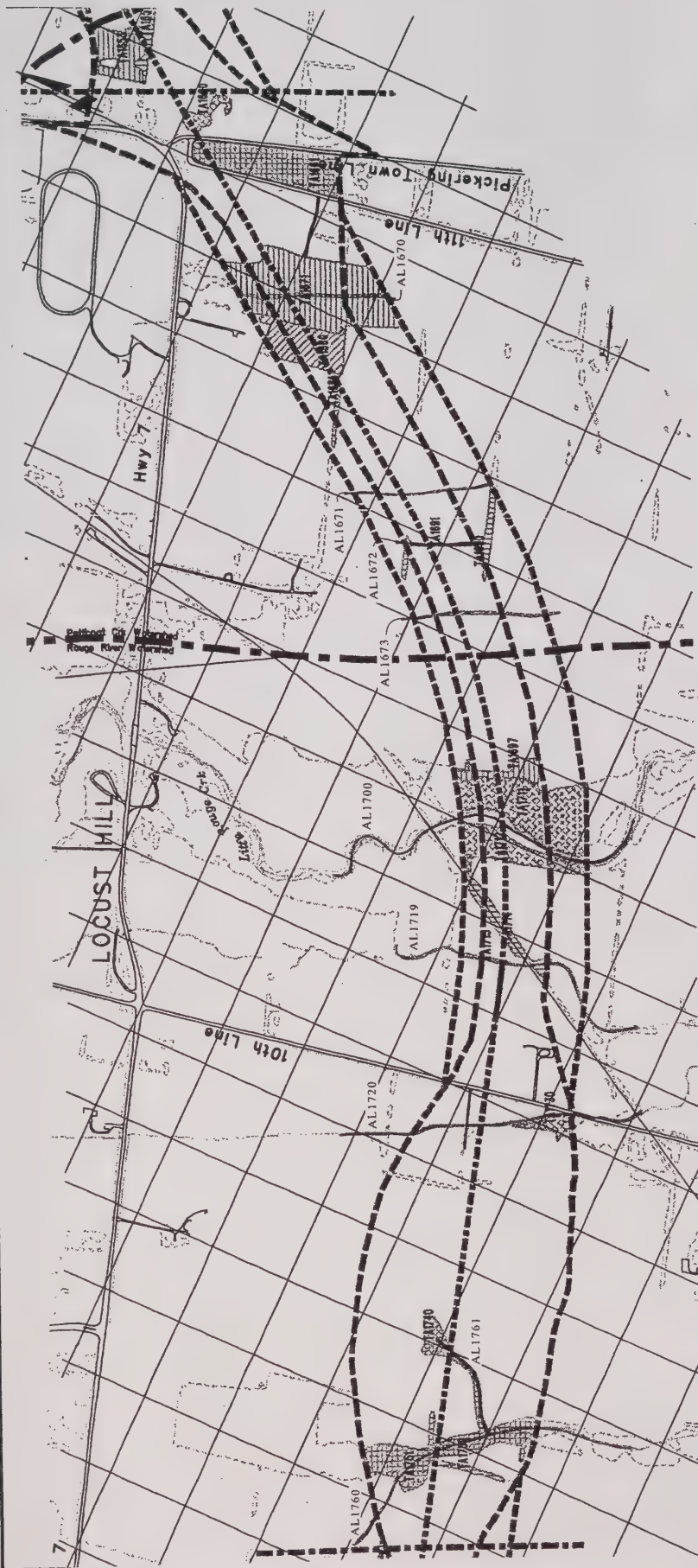
Explanation of Unit Identifier:

eg. TA1234
AL1357

T
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1357

Terrestrial or Aquatic Feature Type
Area or Linear Feature Type
Unit Number





Explanation of
Unit Identifier:

eg. TA1234
AL1357
T
A
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1234
1357

Shrubland
Wetland
Woodland

TERRESTRIAL BIOLOGY

Hedge Row
Old Field
Plantation
Residential Vegetation

Aquatic Biology Study Area
Watershed Boundary
Watercourses (from MTO base data)
Woodlands (from MTO base data)

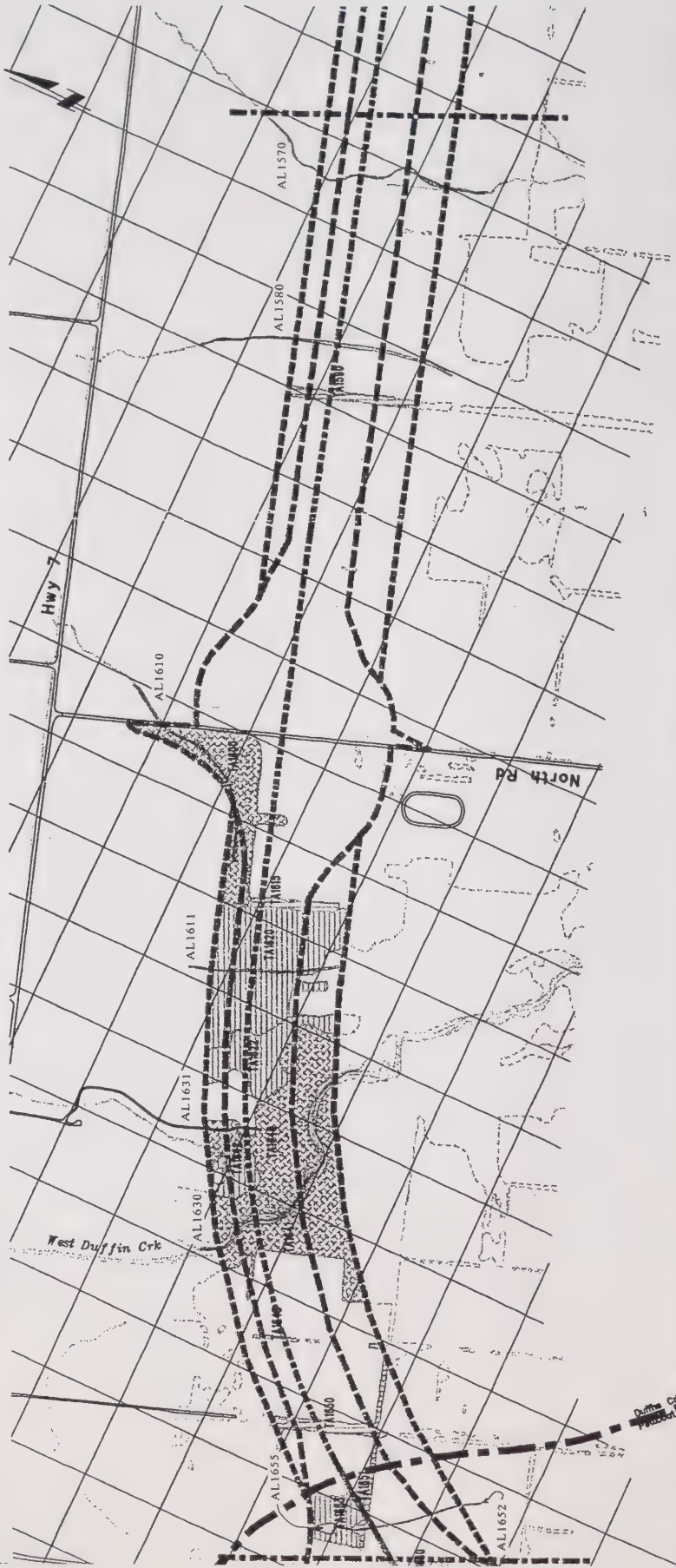
BASE INFORMATION

Match Line
Centreline of Technically Preferred Route
Highway 407/Transit Transportation Corridor/
Terrestrial Biology Study Area

EXHIBIT
6.4.1
AQUATIC & TERRESTRIAL FEATURES



HIGHWAY 407 / TRANSITWAY
MARKHAM ROAD EASTERLY TO
HIGHWAY 7 EAST OF BROOK ROAD



BASE INFORMATION

Match Line
Centreline of Technically Preferred Route
Highway 407/Transit Transportation Corridor/
Terrestrial Biology Study Area

TERRESTRIAL BIOLOGY

Aquatic Biology Study Area
Watershed Boundary
Watercourses (from MTO base data)
Woodlands (from MTO base data)

Hedge Row
Old Field
Plantation
Residential Vegetation

Explanation of Unit Identifier:

eg. T A L
1234
1357

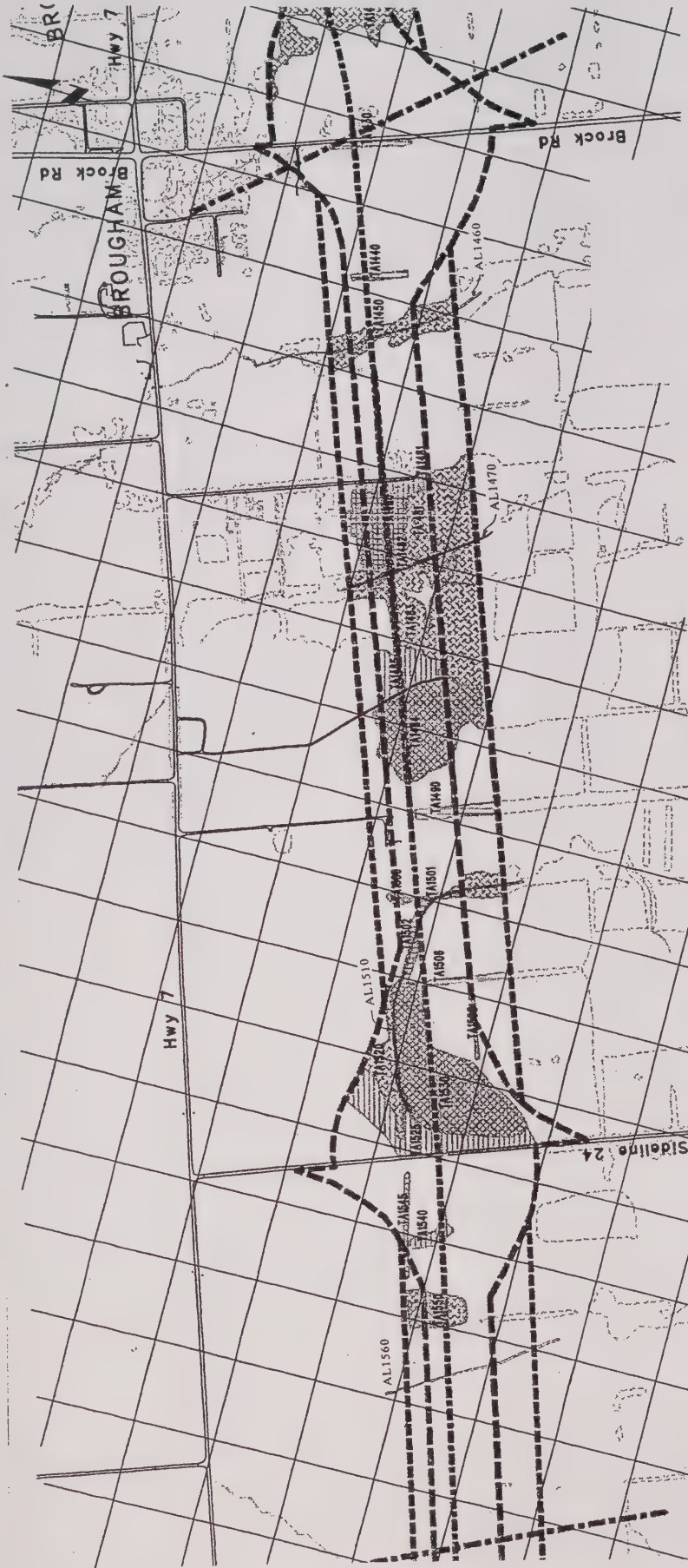
Terrestrial or
Aquatic Feature Type
Area or
Linear Feature Type
Unit Number

HIGHWAY 407 / TRANSITWAY
MARKHAM ROAD EASTERLY TO
HIGHWAY 7 EAST OF BROCK ROAD



AQUATIC & TERRESTRIAL FEATURES

EXHIBIT
6.4.1



Explanation of Unit Identifier:

eg: TA1234
AL1357
T
A
L
1234
1357

Terrestrial or Aquatic Feature Type
Area of Linear Feature Type
Unit Number

TERRESTRIAL BIOLOGY

- Hedge Row
- Old Field
- Plantation
- Residential Vegetation

- Aquatic Biology Study Area
- Watershed Boundary
- Watercourses (from MTO base data)
- Woodlands (from MTO base data)

BASE INFORMATION

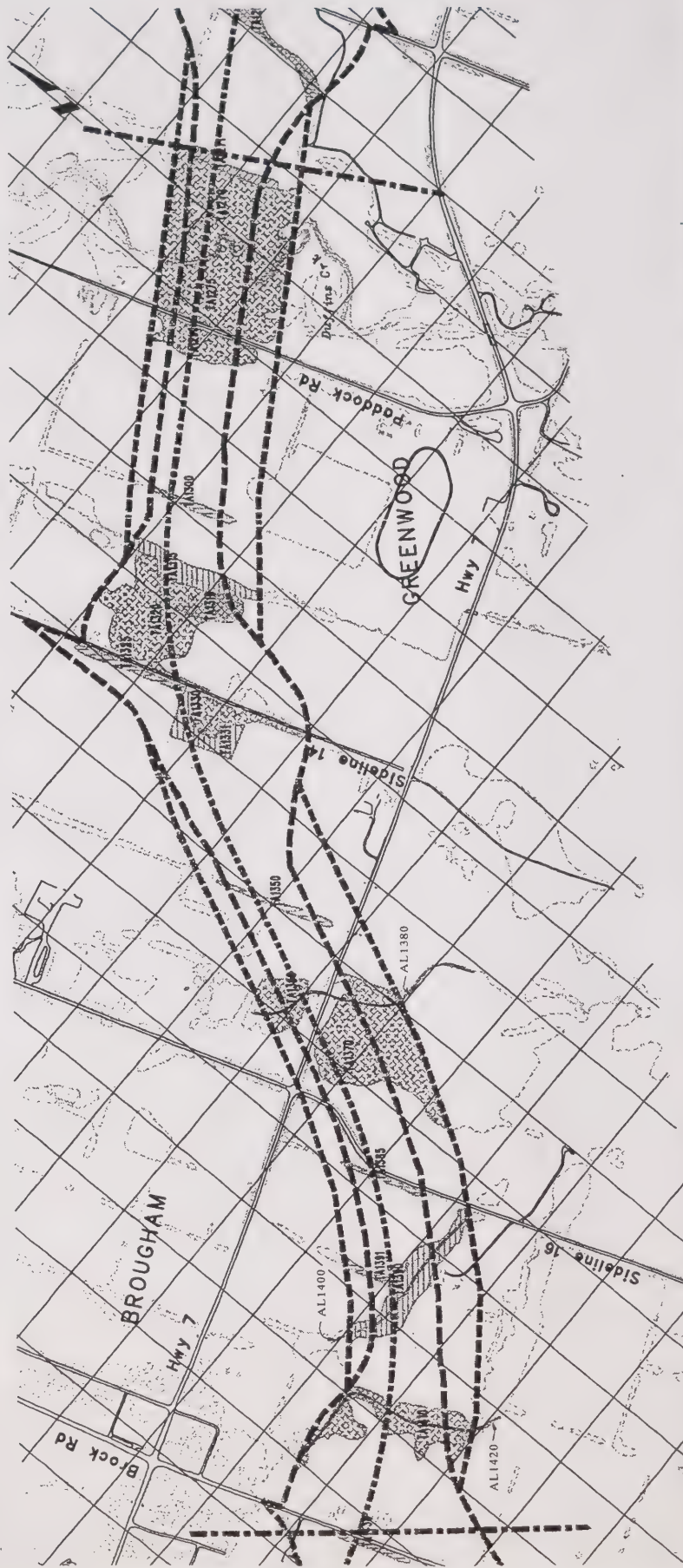
- Match Line
- Centreline of Technically Preferred Route
- Highway 407/Transitway Transportation Corridor
- Terrestrial Biology Study Area

EXHIBIT 6.4.1

AQUATIC & TERRESTRIAL FEATURES



HIGHWAY 407 / TRANSITWAY
MARKHAM ROAD EASTERLY TO
HIGHWAY 7 EAST OF BROOK ROAD



BASE INFORMATION

- Match Line
- Centreline of Technically Preferred Route
- Highway 407/Transit Transportation Corridor
- Terrestrial Biology Study Area

TERRESTRIAL BIOLOGY

- Aquatic Biology Study Area
- Watershed Boundary
- Watercourses (from MTO base data)
- Woodlands (from MTO base data)
- Hedge Row
- Old Field
- Plantation
- Residential Vegetation

- Shrubland
- Wetland
- Woodland

Explanation of Unit Identifier:

- eg: TA0234
- AL1357
- T
- A
- L
- 1234
- 1357
- Terrestrial or Aquatic Feature Type
- Area or Linear Feature Type
- Unit Number

HIGHWAY 407 / TRANSITWAY
MARKHAM ROAD EASTERLY TO
HIGHWAY 7 EAST OF BROCK ROAD



AQUATIC & TERRESTRIAL FEATURES

EXHIBIT
6.4.1

6.4.1 Natural Environment

Fisheries, Water Quality and Navigation

To facilitate design, terrestrial and aquatic field investigations were conducted in 1995. The terms of reference for this work was developed in consultation with MNR. The draft documentation of this work was reviewed by MNR and revised to address their comments. Subsequently additional fisheries field work was carried out in the spring/summer of 1996, following terms of reference that were agreed to by MTO, MNR, MTRC and DFO. The purpose of this additional field work was to determine the presence of threatened, vulnerable, rare or endangered species and, if present, to identify any critical habitat potentially affected by the undertaking. This information will assist in the determination of specific effects of the design alternatives and the development of mitigating measures and/or compensation requirements. The development of fisheries mitigating measures and compensation planning will be based on standard practices and protocols and carried out in close consultation with affected provincial and federal agencies during the design.

The undertaking crosses 3 major watercourses (Rouge River, Little Rouge Creek and West Duffins Creek), and 25 smaller tributaries. Based on the information gathered during the Route Planning Study and the detailed investigations in 1995, it is evident that the fisheries in the Rouge River, Little Rouge Creek and West Duffins Creek systems are significant. Significant species of the Rouge River system include largemouth bass, coho and chinook salmon, and brown and rainbow trout. The vulnerable¹ redbide dace (*Clinostomas elongatus*) has been collected at numerous locations in the headwaters of the Rouge River over 8 km upstream of the study area. MNR reports that the provincially rare Central Stoneroller has been captured downstream of the proposed crossing location. The Little Rouge Creek contains the provincially rare Central Stoneroller, Hornyhead Chub, and Stonecat and West Duffins Creek contains the nationally vulnerable Redside Dace. Migratory fisheries (i.e. trout and salmon) exist in the Little Rouge Creek for which convenient upstream passage should be considered in later design stages.

During the consultation phase, the Ministry of Natural Resources requested that additional fisheries information be gathered to guide the design of the crossings and necessary mitigating measures. As well, the Department of Fisheries and Oceans (DFO) advised on the information required should an application under the Federal Fisheries Act become necessary. In response to these comments the Ministry of Transportation conducted a fisheries inventory and observations were made at each crossing during the spring and summer of 1996, following terms of reference developed in consultation with and agreed to by MTO, MNR, MTRC and DFO. This information has been made available to MNR, DFO and MTRC and will be used during the design of the crossing, and the development of mitigating measures.

¹ As established by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC).

Several agencies (DOE, MOEE, MNR, MTRC, DFO) expressed concerns about the management of highway drainage, and erosion to minimize potential adverse quantity and quality impacts on soils, surface water and groundwater.

The Canadian Coast Guard has identified the Rouge River as the only navigable watercourse crossed by the Highway 407 project, and has provided comments on crossing requirements. This crossing will require an authorization under the Navigable Waters Protection Act (NWPA) which will trigger a screening under the Canadian Environmental Assessment Act (CEAA). Prior to obtaining CEAA and NWPA approval for this crossing, navigation and environmental concerns must be addressed.

The following sets out the objectives that will guide the design phase in order to deal with the concerns raised during this study.

Watercourse Crossings

As a result of this more detailed field work, the Ministry has committed to providing bridges at 6 key crossings. Bridges are proposed at the Rouge River, the Little Rouge Creek, the West Duffins Creek, an unnamed tributary of the West Duffins Creek (Lot 3 Concession 5), Ufré Creek and an unnamed tributary of the Duffins Creek located east of Brougham (NE part of Lot 16, Concession 5) if a new crossing is required. In addition, bridges will be considered for other crossing locations where warranted to minimize aquatic and terrestrial impacts. The following objectives apply wherever water crossings are utilized:

- Consult with MNR, MOEE, MTRC, and DFO during design.
- When designing and constructing facilities in the vicinity of lakes and watercourses, the proponent will have regard to the provisions of the Lakes and Rivers Improvement Act, and O.Reg 158/90 under the Conservation Authorities Act.
- Design crossings so as not to impede fish movement.
- Design the Rouge River structure to avoid interfering with navigation.
- Avoid the placement of piers within the watercourse channel under bankfull flow conditions.
- Minimize the placement of fill and abutments within the regulatory flood plain, and/or the meanderbelt or 100 year erosion limit of watercourses.
- Where practical, orient bridge piers in the direction of flow so as to maximize hydraulic efficiency during flood conditions.

- Where possible, design bridges to minimize/avoid alteration to the watercourse.
- Develop and implement erosion control plans before, during and after construction.
- Develop access roads for bridge construction and maintenance to minimize disruption to the natural systems and slope stability. Restore access roads that are not required for future structure maintenance. Stabilize access roads that will be required for future maintenance.
- Design crossings with consideration for wildlife and human passage.
- Conduct ongoing consultation with affected agencies during the design and construction phases.
- Where site conditions permit, maintain or re-establish riparian vegetation on both sides of watercourses.
- Conduct a drainage analysis and design the structures so as to minimize erosion and flood risk upstream and downstream of the structure.
- Where feasible, closed-bottomed culverts will not be used in upwelling areas.
- Time any necessary in-stream construction to avoid critical fish migration and spawning periods, or construct in the dry. Any temporary realignments of watercourses to permit construction in the dry will be designed in consultations with MNR, MTRC, RPA and DFO.
- In those situations where MNR determines that there will be harmful alteration of fish habitat, submit an Application for the Authorization for the Alteration of Fish Habitat (with supporting plans) to DFO. Develop the compensation plan and Application for Authorization in consultation with MNR, MTRC, RPA and DFO.

Groundwater

During the consultation phase the MOEE and DOE expressed concerns about the potential groundwater implications of the undertaking, including impact on wells.

The hydrogeological condition of the area is important to supporting the environmental features and ecological functions of the area. As part of the Route Planning Study, a review of the groundwater conditions of the study area was carried out. One hundred and ten hectares of potential recharge area and three high and three moderately high upwelling and seepage areas are crossed by the undertaking. Although no aquifers are expected to be impacted, there are 10 wells in the vicinity of the route that could be affected by construction activities.

To protect groundwater resources, the following objectives apply:

- At the design stage, contact will be made with external stakeholders to update information on groundwater resources.
- The designers and the contractor will be responsible for addressing quantity or quality impacts to shallow groundwater resulting from the construction of the undertaking.
- Where dewatering operations are required, applicable Water Taking Permits and Certificates of Approval will be obtained.
- Any wells or septic systems removed from service as part of the undertaking will be properly abandoned/decommissioned.

Stormwater Management

The following objectives apply to this undertaking.

- During the design phase, prepare a Stormwater Management Plan, dealing with both water quantity and quality, in accordance with MTO guidelines in consultation with MOEE, MNR, MTRC, DFO, DOE and the RPA.
- The proponent will strive to design stormwater management ponds to detain the minimum of a 2 hour 25mm storm event for 24 hours to address water quality and erosion concerns. Where agencies demonstrate a need, other detention times or additional quantity sizing requirements will be considered during the design phase in consultation with stakeholders.
- When designing BMPs, consideration will be given to measures for reducing adverse environmental impacts to surface and groundwater, including those related to temperature and salt.
- Bridge runoff should be discharged to stormwater management facilities (preferably a pond or swale) prior to discharge to watercourses where this reasonably can be achieved and will not cause unacceptable environmental, highway design, safety or operational problems.
- Where feasible, opportunities for providing ease of containment of accidental spills will be provided during the design of stormwater management facilities.

Erosion and Sedimentation

Control of erosion and sedimentation during and after construction is important to protecting terrestrial and aquatic resources. The following objectives are to minimize erosion and control sedimentation:

- During the design phase, conduct an analysis of the erosion implications, and develop appropriate temporary and permanent erosion control strategies.
- Consider the potential for destabilizing of banks due to groundwater and soils conditions, during the design phase and develop/implement mitigating strategies where required.
- Develop erosion control plans prior to construction. Erosion control techniques should include such measures as silt barriers, sediment ponds, flow check dams, natural buffers and sediment traps. Erosion control measures will be maintained until erodible areas have been stabilized.
- Bench slopes as necessary to reduce sheet erosion where such practices are deemed to be beneficial and will not cause additional unacceptable disturbance to vegetation, other natural areas or top of slope.

Terrestrial Resources

In 1995 a detailed terrestrial study was carried out for the recommended route to guide the design phase of the study. A more detailed description of the vegetation associated with the technically preferred route is provided in Appendix 20.

Vegetation

The route has been selected to minimize impacts on woodlots. Further reduction in impacts can likely be achieved during the design phase. However, the undertaking has the potential to impact upon 60 ha of woodlands. For the most part, except in the stream valleys, the woodlands affected are not significant. However, to minimize impacts, the following objectives apply.

- Where warranted, vegetation removals will be managed in consultation with MNR, MTRC and RPA.
- During construction, protect vegetation that does not have to be removed.
- The proponent will utilize or provide reasonable opportunities for property owners and interest groups to salvage/transplant vegetation and seed sources.

Wildlife and Corridors

Wildlife habitat and corridors are important to the long-term survival of wildlife populations. Natural corridors are defined as linear natural features such as streams, floodplains, steep slopes, valleys, contiguous narrow woodlands and wetlands, that connect larger woodland blocks. Studies show that natural corridors:

- may allow for the passage of animals requiring a variety of habitats for their survival;
- may allow for the movement of plants and animals to other areas, thereby, increasing their population;
- may provide for reproductive interchanges for plants and animals - promoting genetic variation; and
- may provide escape routes for animals from predators, and natural and human disturbances.

Corridors may also have negative effects such as:

- increased edge effects such as predation;
- providing funnelling thereby increasing exposure to predatory risk; and
- providing for the movement of disease, or dispersal of undesirable species.

Within the study area, the more significant wildlife habitat and corridors are associated with the major north-south river valleys. Intrusion into these areas can adversely affect wildlife. The barrier impacts of the Highway 407/Transitway on corridors along the Rouge River, Little Rouge Creek, West Duffins Creek, Urfé Creek and two unnamed tributaries will be mitigated by the proposed bridge crossings. Other corridors will be reviewed at the time of design giving consideration to key principles that will be established jointly between the proponent and MNR, prior to the commencement of design. When developing these principles, consideration will be given to the following factor:

- the size of corridor linkages
- the presence of an incised valley
- the contiguous value of terrestrial units and connectivity
- the size of valley vegetative units/systems
- habitat diversity
- connection and width of riparian vegetation
- existing wildlife species
- the distance between corridors
- Green Lands Strategies
- resilience of features

In addition to considering the principles discussed above during the design phase, the following objectives are proposed to further reduce wildlife impacts.

- Where possible, develop planting programs in consultation with MNR, MTRC, RPA and DOE to encourage habitat/corridor functions at watercourse crossings. Use native species where practical.
- When necessary, time tree removal to avoid significant nesting of migratory birds.
- Where practical and feasible, fill, top-dress and seed rip rap that could be hazardous to larger mammals.

Air Quality/Energy

Transportation consumes energy which produces air emissions that contribute to climate change, acid precipitation and urban smog. Studies show that energy consumption can be reduced and air quality can be improved through improved vehicle design, promotion of public transit, reduced demand through better urban design, and improved traffic flow (e.g. reduced congestion). Many of these improvements are beyond the scope of a specific transportation project, and need to be addressed through vehicle design, urban land use planning, and strategic transportation planning. At the project level local energy and air quality issues generally do not affect the evaluation of route alternatives.

The available models for predicting and assessing local air quality impacts of transportation facilities are under review. To advance the understanding of transportation-related impacts, the Ministry of Transportation has commissioned a research study to calibrate the prediction models to Ontario's conditions. This study has not yet reached the stage where general conclusions applicable to the Highway 407 project, can be drawn. When the study is complete, MTO will review with MOEE how the study finding should be used at the project level. If the results of these discussions are applicable to the Highway 407 project between Markham Road and Highway 7 east of Brock Road, then efforts will be made to incorporate the findings at that time.

As discussed in Chapters 2 and 5 of this report, without the extension of Highway 407 east of Markham Road there will be a high degree of congestion in downtown Markham and the communities of Box Grove, Locust Hill, Whitevale and Brougham. The proposed extension of Highway 407 will reduce volumes and congestion in these communities. The provision of a transitway will reduce transportation-related energy consumption and air emissions.

Spills

Concerns were raised about the environmental implications of on-highway spills. Under Ontario's Environmental Protection Act, the remediation of on-highway spills is the

responsibility of the owner of the spilled pollutant or the person having control of the pollutant at the time of the spill. Therefore, the proponent will be responsible for the remediation of any spills resulting from its operations. As well, where feasible, opportunities for providing ease of containment of accidental spills will be provided for as part of the design of stormwater management facilities.

Landfills and Soil Contamination

The undertaking does not cross any known areas where waste materials have been landfilled. The undertaking does however, cross the north-western most corner of the Brock North Landfill property located on Part Lot 16, Concession 5 in the Town of Pickering. Although the entire site was certified for use as a landfill, only that portion of the site located approximately .5 to 1 kilometre to the south of the proposed Highway 407/Transitway right-of-way was actually used for waste disposal. Early in 1997, the owner of the site began removing the waste material to another licensed landfill with the concurrence of the MOEE. The proponent is contacting the MOEE to confirm whether or not any approvals under the Environmental Protection Act (EPA) will be necessary.

Preliminary site screening of accessible property was conducted, and, because the lands required for the undertaking are primarily in agricultural usage, significant waste deposition or soil contamination was not identified and is not suspected. However, it is possible that landfilled waste or other contamination may be discovered during subsequent phases including property acquisition. Any waste materials or contaminated soils encountered will be managed in accordance with the requirements of applicable legislation, such as the EPA, and applicable guidelines such as the MOEE Guidelines for Use at Contaminated Sites in Ontario.

6.4.2 Social Environment

Community Impacts

The major landowners and municipalities in the study area have been involved with the study and have developed municipal and land use plans taking into account the Highway 407 technically preferred route. Therefore, for the most part, the undertaking is compatible with planned land uses for the study area.

The undertaking will reduce traffic volumes through Markham, Box Grove, Green River, Locust Hill, Whitevale and Brougham. This will improve the quality of living in these communities by reducing traffic and congestion. However, the undertaking may result in an increase in traffic volumes in Greenwood. The Town of Pickering is investigating traffic calming methods and local road improvements to address existing/potential traffic concerns in Greenwood.

The undertaking will displace 21 residences, and encroach upon 64 public and 10 private properties. Where possible, impacts on residences and private properties will be minimized during the design phase.

Recreation

The crossing of West Duffins Creek could impact the recreational amenities of the Seaton Hiking Trail and the Seaton Flying Club with proximity effects. The effects on the trails will be minimized through the use of a bridge to cross the West Duffins Creek. The Seaton Flying Club and the Pickering Rod and Gun Club will be displaced in accordance with the terms of their lease.

Aesthetics

There will be visual exposure of the Highway 407 from residents along the right-of-way in the Town of Markham, and the Hamlet of Brougham. There will also be some exposure from Locust Hill and some residents along Highway 7, who will have a view of the facility. Topography and vegetation in the hamlet of Green River will provide some visual screening of the facility, as viewed to the south. However, it will be visible at the easterly and westerly approaches to the hamlet. During detailed design, opportunities for addressing visual impacts will be considered.

Noise

Noise impacts on sensitive receptors was a consideration during the evaluation of route alternatives. With the implementation of the undertaking, several residences may experience noise increases between 5 dB and 20 dB, and may experience resultant noise levels greater than 55 dB. During the design phase, a more detailed noise analysis will be carried out and where warranted, noise mitigation measures will be developed. Typical mitigating measures include construction of berms and/or barriers, modification in the horizontal and vertical alignment of the facility, and/or the use of quieter pavements. The detailed noise study will be conducted in accordance with the Highway Noise Impact Assessment Methodology set out in Appendix 23.

Since, for the most part, the alignment passes through undeveloped lands, and the owners of the lands were involved with the planning process, the mitigation of noise impacts is not anticipated to be a problem. However, mitigating measures may be required to address the noise impacts on homes adjacent to the right-of-way in the Town of Markham. The results of the noise study will be submitted to the MOEE for verification prior to construction.

At the design stage, site specific noise mitigating measures will be developed in consultation with the MOEE. Accordingly, the following objectives will apply:

- Identify noise and vibration sensitive areas.
- Establish operational noise impacts and, if sound levels exceed the applicable limits, develop and implement appropriate noise mitigating measures in consultation with MOEE and in accordance with the MTO/MOEE Noise Protocol.
- Identify and consider applicable municipal noise control by-laws. Where timing constraints, or any other municipal by-law may cause hardship to the proponent, an exemption from this requirement should be sought directly from the municipality in question.
- Minimize construction noise by ensuring that noise control devices on construction equipment are properly maintained.

6.4.3 Cultural Environment

During the Route Planning Phase, archaeological sites and historical buildings were identified. In addition, there is the potential that undiscovered archaeological sites exist within the proposed right of way of the technically preferred route. To ensure that heritage resources are identified and protected, the following is proposed:

- Field investigations are now underway to identify the specific nature and extent of archaeological resources impacted by the highway, and to develop appropriate mitigating measures. This is being done in accordance with the MTO/MCzCR Protocol for Dealing with Archaeological Concerns on Ministry of Transportation Undertakings. Any necessary salvage work will be carried out prior to construction.
- The mitigation of impacts to all historical buildings adversely affected by this undertaking will be developed in consultation with MCzCR and the local heritage planners. The assessment work is currently underway, and any necessary mitigating measures will be implemented prior to construction.

6.4.4 Economic Environment

The undertaking is not expected to have significant adverse effects on the economic environment of the area. The undertaking will have positive effects by improving access thereby supporting initiatives such as the Federal Airport Lands, and the Cornell and Seaton Community plans. As discussed in the Chapter 3, inadequate transportation has been a barrier to growth in the Region of Durham. The extension of Highway 407 will support the planned growth envisaged in the York and Durham Official Plans.

Agriculture

The undertaking will remove approximately 381.5 ha of Class 1 & 2 farmland and 5.1 ha of Class 3 & 4 farmland from production, representing a permanent loss of this resource. In addition, 11 farm operations would be affected: 1 dairy farm, 2 horse farms, 1 beef operation, 1 nursery, and 6 cash crop operations. The relocation of Highway 7 to accommodate the Durham-York Line (York Regional Road 30) interchange represents an additional impact and severs one operation in Lot 11 Concession 10 near Markham. Most of the land affected is in public ownership. As well, a large portion of the lands are within the boundary of the Seaton Community Planning area. Where possible, farm severances will be reduced during detailed design. During the consultation phase the Ministry of Agriculture, Food and Rural Affairs supported the Highway 407 project provided it does not deviate from the technically preferred route identified through the Route Planning Study.

6.4.5 Follow-up

Follow-up activities may be required to ensure that environmental protection measures that have been committed to, are properly implemented during construction. To this end, the following objectives apply:

- Develop construction/contract measures to ensure compliance with environmental protection commitments, and ensure that clear responsibility for environmental inspection is assigned.
- Hold ongoing discussions with the contractors to address issues.
- Undertake audits to ensure that contract provisions are followed and that corrective actions are undertaken if necessary.
- During the design phase and as part of the Stakeholder Consultation Process, determine the need for post-construction monitoring (e.g. stormwater, fisheries) in consultation with MNR, MOEE, MTRC, RPA DOE and DFO. If a monitoring plan is needed, a plan will be prepared and implemented as appropriate.

6.5 PROCESS FOR ADDRESSING NEW CONCERNS

The Ministry of Transportation (MTO) in submitting this Environmental Assessment to the Ministry of Environment and Energy, has attempted to provide as much detail as possible about both the undertaking itself, and the anticipated net environmental impacts. After approval under the Environmental Assessment Act is granted for an undertaking, the standard approach is to initiate further technical investigations during the design phase of the project. In addition to the more detailed technical work, further consultation with all stakeholders is also undertaken at that

time. Issues and concerns which are raised during the detail design are documented and addressed in Design and Construction Reports which are filed for information purposes prior to any construction.

Although MTO has attempted to be as thorough as possible, there is a possibility that the design may identify significant environmental impacts which may not have been anticipated in the Environmental Assessment Report. These impacts may fall into either of two categories. The first category includes changes to the proposed undertaking which are required because of new information resulting from the design engineering and environmental investigations. The second category includes short term impacts which result from construction staging of the undertaking. The staging of construction is dependent upon financial resources, provincial priorities, and realized growth in demand, and can only be determined during the design phase.

The proponent is committed to addressing the environmental concerns resulting from this undertaking whether identified in the Environmental Assessment Report or during the design phase prior to construction. All component projects of this undertaking will be screened during their design for new concerns and appropriate mitigating measures will be developed in consultation with appropriate stakeholders.

In the event that conditions occur which result in a proposed change in the undertaking that would:

- require properties additional to those required to implement the undertaking as approved, or
- result in other than a minor change to commitments or net impacts identified in this EA;

then the change will be discussed with the affected stakeholders, including MOEE. If no agreement can be reached with the stakeholders, the change will be addressed under a Class EA-type process with Environmental Study Report (ESR) documentation and the opportunity for “bump-up”. The final decision is to be made by the Minister of Environment and Energy. Only the change under consideration and associated impacts would be subject to review under this process.

The initial phase of the undertaking will be the construction of a 4-6 lane freeway between Markham Road and Highway 7 east of Brock Road, with the associated interchanges, and the Highway 7 realignment. As traffic demand increases beyond the capacity, the Transitway will be constructed and/or Highway 407 will be expanded. However, the rate at which the freeway is expanded will be dependant upon the ability of the adjacent transportation network to handle the traffic. The MTO is proceeding with the planning and approvals of the Highway 407 East to Highway 35/115.

6.6 SUMMARY OF CONCERNS/POTENTIAL ENVIRONMENTAL EFFECTS/ PROPOSED MITIGATING MEASURES AND COMMITMENTS TO FURTHER WORK

Table 6.6.1 provides a summary of: environmental issues/concerns; the concerned external interests that identified the issues; the potential environmental effects of the undertaking; the proposed mitigating measure; the commitments to future work; and where in this chapter further discussion of the mitigating measure can be found.

Steps taken during the design stage of the project to address and finalize environmental commitments will be documented in "Design and Construction" reports which will be available to stakeholder agencies for information and monitoring purposes prior to construction.

In Table 6.6.1, the following shortforms apply:

MNR	- Ministry of Natural Resources	DFO	- Department of Fisheries and Oceans
MOEE	- Ministry of Environment and Energy	DOE	- Environment Canada
MTRC	- Metro Toronto Region Conservation	MCzCR	- Ministry of Citizenship, Culture and Communications
RPA	- Rouge Park Alliance	LACAC	-Local Architectural Conservation Advisory Committee
SCP	- Stakeholder Consultation Process		

NOTE: In the following table, it is stated that at that some watercourses may be placed into culverts. This is intended to make the reader aware of the potential for the use of culverts at some crossings. However, as stated throughout this EA, the actual type of crossing to be employed will not be determined until the design stage, and will be done in consultation with affected stakeholders.

TABLE 6.6.1

SUMMARY OF CONCERNS/POTENTIAL EFFECTS/PROPOSED MITIGATING MEASURES AND COMMITMENTS TO FURTHER WORK

Location	Environmental Issues/ Concerns	Concerned Group/Agency	Potential Environmental Effects of the Undertaking	Proposed Mitigating Measures, Commitments to Further Work	Comments
Entire Route	Upstream flood levels and downstream erosion at watercrossing.	MNR, MTRC, MOEE, RPA, Municipality, Public	Restriction of the valley could cause increased flood levels upstream, and increased water velocity resulting in downstream erosion.	A drainage analysis will be carried out to ensure that crossings are designed to minimize erosion and flood risk.	See Section 6.4.1
	Runoff impacts on watercourses	MNR, MOEE, MTRC, RPA, Municipality, DFO, DOE, Interest Groups, Public	Stormwater runoff can adversely affect water quality, fish habitat and stream erosion.	Stormwater management plan will be developed. Erosion control plan will be developed.	See Section 6.4.1
	Archaeological sites	MCzCR, LACAC, Municipality	Loss of archaeological resources.	Pre-construction archaeological surveys and mitigation will be done in consultation with Heritage agencies.	See Section 6.4.3
	Fish habitat	MNR, MTRC, RPA, DFO, DOE, Interest Groups, Public	Harmful alteration of fish habitat.	Stream assessment and crossing design in accordance with SCP. Compensation plans in accordance with Fisheries Act.	See Sections 6.3.2 & 6.4.1
	Groundwater upwelling areas	MNR, MOEE, MTRC, DFO, DOE	Culverts can interfere with upwelling areas adversely affecting baseflows to coldwater streams.	Open-bottomed culverts/bridges will be considered in upwelling areas.	See Section 6.4.1
	Spills	MOEE, MNR, MTRC, RPA, DFO, DOE, Interest Groups, Public	Spills can cause adverse effects on surface and ground water and soils.	Ease of containment of spills at stormwater management facilities will be reviewed during design.	See Section 6.4.1

TABLE 6.6.1

SUMMARY OF CONCERNS/POTENTIAL EFFECTS/PROPOSED MITIGATING MEASURES AND COMMITMENTS TO FURTHER WORK

Location	Environmental Issues/ Concerns	Concerned Group/Agency	Potential Environmental Effects of the Undertaking	Proposed Mitigating Measures, Commitments to Further Work	Comments
Entire Route	Contaminated sites	MOEE	Unknown contaminated sites may be encountered during design or construction.	A Phase 1 assessment of property is currently underway. Sites will be managed in accordance with MOEE's decommissioning guidelines.	See Section 6.4.1
	Noise	MOEE, Municipality, Public	Increased noise	Detailed noise studies will be carried out during design phase and appropriate mitigating measures will be determined.	See Section 6.4.2
	Agricultural land	OMAFRA, Public	Loss of prime agricultural land.	Impact reduced through planning. Opportunities for further reduction will be considered during design	See Section 6.4.4
	Impacts on wells/septic systems	MOEE, Municipality, Public	Reduction in supply. Impacts on quality and quantity of groundwater. Possible pathway to aquifers if not properly abandoned.	Contractor will be responsible for correcting impacts resulting from construction. Wells and septic systems removed from service will be properly abandoned/decommissioned.	See Section 6.4.1
	Impacts on groundwater recharge areas.	MOEE, MNR, MTRC, Municipality, DFO, DOE	Roadway runoff and spills can adversely affect groundwater quality.	Stormwater management plans will be developed to minimize the effects of stormwater. (See spills.)	See Section 6.4.1

TABLE 6.6.1

SUMMARY OF CONCERNS/POTENTIAL EFFECTS/PROPOSED MITIGATING MEASURES AND COMMITMENTS TO FURTHER WORK

Location	Environmental Issues/ Concerns	Concerned Group/Agency	Potential Environmental Effects of the Undertaking	Proposed Mitigating Measures, Commitments to Further Work	Comments
Markham Rd. - Rouge Valley (Approx. 400m)	Residential developments to north and south of right of way	MOEE Residents Public	Increased noise.	Detailed noise studies will be carried out during design phase and appropriate mitigating measures will be determined.	See Section 6.4.2
	Loss of homes	Residents	Two private residences removed.	Lands will be acquired at fair market value.	See Section 6.4.2
	Potential Archaeological Site at Crossing	MCzCR, LACAC, Public	Displacement/damage	Avoidance has been confirmed by field study.	See Section 6.4.3
Rouge Valley Crossing (Approx. 250m)	Steep wooded west slope and floodplain, with diverse vegetative community providing good wildlife habitat and travel corridor. Valley used for passive recreation.	MNR, MTRC, RPA, DOE, Municipality, Interest Groups, Public	Vegetation removals impacts on wildlife habitat and corridor value. Important to maintain passage for people using the valley for passive recreation.	Bridge will be used to cross the Rouge River thereby minimizing disruption to the vegetation in the valley and maintaining travel corridor for people and wildlife. Where possible, riparian vegetation will be maintained or re-established.	See Section 6.4.1
			Access roads for bridge construction and maintenance can impact on the valley ecosystem and slope stability.	Develop access roads to minimize disruption of natural systems and slope stability.	
	Highly significant coldwater fishery with migratory and resident salmonids	MNR, MOEE, MTRC, RPA, DOE, DFO, Interest Groups, Public	Potential loss of fish habitat if stream has to be realigned, or if there is instream construction. Runoff, erosion and sedimentation can impact water quality & fish habitat.	Watercourse will be spanned with a bridge. No piers will be placed into the watercourse. Stormwater management and erosion control plans will be developed.	See Section 6.4.1
	The Rouge River is a navigable waterway.	DFO	Restriction of the watercourse can interfere with navigation.	The Rouge River bridge will be designed to avoid interfering with navigation.	See Section 6.4.1

TABLE 6.6.1

SUMMARY OF CONCERNS/POTENTIAL EFFECTS/PROPOSED MITIGATING MEASURES AND COMMITMENTS TO FURTHER WORK

Location	Environmental Issues/ Concerns	Concerned Group/Agency	Potential Environmental Effects of the Undertaking	Proposed Mitigating Measures, Commitments to Further Work	Comments
Rouge River - 9th Line (Approx. 1.5 km)	Predominantly open field with some shrubland and planted vegetation. Residential development to the north of the right of way	MOEE, Residents, Public	Increased noise.	Detailed noise studies will be carried out during design phase and appropriate mitigating measures will be determined.	See Section 6.4.2
	Loss of homes, impacts on Minto property and Golf Course	Residents	Residences on the west side of 9th Line may be removed - private and leased.	Notice will be given to tenants in accordance with the lease provisions. Private property will be purchased at fair market value.	See Section 6.4.2
	Crosses watercourse AL 1794 - a low significance warmwater intermittent stream along 9th Line.	MNR, MTRC, MOEE, RPA, DFO, DOE	Watercourse may be placed into a culvert.	Stream assessment and crossing design in accordance with SCP.	See Section 6.4.1
9th Line - 10th Line (Approx. 2 km)	Impacts on private land. Removal of historic building at 9th Line	MCzCR, LACAC, Residents	Privately owned lands may need to be acquired. Loss of historic information on building.	Lands will be acquired at fair market value. Impacts on historic building will be mitigated in consultation with Markham Heritage & MCzCR.	See Section 6.4.2 6.4.3
	Crosses AL 1780 - a low significance warmwater intermittent stream with old field and shrubland vegetation on both sides. Deer and song birds use the area.	MNR, MOEE, MTRC, RPA, DFO, DOE	Watercourse may be placed into a culvert. Approximately 1 ha of shrubland and oldfield vegetation may be removed. Impacts are not considered to be significant.	Stream assessment and crossing design in accordance with SCP.	See Section 6.4.1

TABLE 6.6.1

SUMMARY OF CONCERNS/POTENTIAL EFFECTS/PROPOSED MITIGATING MEASURES AND COMMITMENTS TO FURTHER WORK

Location	Environmental Issues/ Concerns	Concerned Group/Agency	Potential Environmental Effects of the Undertaking	Proposed Mitigating Measures, Commitments to Further Work	Comments
9th Line - 10th Line(Cont'd)	Crosses AL 1760 and AL 1761 - both low significance warmwater intermittent streams with old field and shrubland vegetation on both sides. The vegetative unit is an extension of a larger woodlot to the north, and provides some local corridor function for deer.	MNR, MOEE, MTRC, RPA, DFO, DOE	Watercourses may be placed into culverts and approximately 3.4 ha of vegetation may be removed. The wildlife movement in this corridor may be blocked.	Stream assessment and crossing design in accordance with SCP.	See Section 6.4.1
	Historic building on west side of 10th Line. Loss of homes.	MCzCR, LACAC, Residents	Loss of historic information on building. Displacement of residents.	Impacts on historic building will be mitigated in consultation with Markham Heritage & MCzCR. Notice will be given in accordance with lease provisions.	See Section 6.4.2 & 6.4.3
	Archaeological sites	MCzCR, LACAC	Encroachment on Iroquoian Village close to right-of-way east of 9th Line.	Location of site will be confirmed in field and avoided if possible. If cannot be avoided, it will be salvaged.	See Section 6.4.3
	Crosses AL 1720 just west of 10th Line - watercourse is low significance warmwater intermittent stream, with a small woodlot to the south side of the right-of-way.	MNR, MOEE, MTRC, RPA, DFO, DOE	Watercourse may be placed into a culvert and approximately 0.4 ha of vegetation may be removed.	Stream assessment and crossing design in accordance with SCP.	See Section 6.4.1
10th Line to Little Rouge Valley (Approx 550m)	Historic building on east side of 10th Line. Displacement of Tenants	MCzCR, LACAC, Residents	Loss of historic information on building. Displacement of residents.	Impacts on historic building will be mitigated in consultation with Markham Heritage & MCzCR. Notice will be given in accordance with lease provisions.	See Sections 6.4.2 & 6.4.3

TABLE 6.6.1

SUMMARY OF CONCERNS/POTENTIAL EFFECTS/PROPOSED MITIGATING MEASURES AND COMMITMENTS TO FURTHER WORK

Location	Environmental Issues/ Concerns	Concerned Group/Agency	Potential Environmental Effects of the Undertaking	Proposed Mitigating Measures, Commitments to Further Work	Comments
10th Line to Little Rouge Valley (Cont'd)	Crosses AL 1719 west of rail line - watercourse is low significance warmwater intermittent stream, with associated hedgerow.	MNR, MOEE, MTRC, RPA, DFO, DOE	Watercourse may be placed into a culvert and approximately 0.1 ha of vegetation may be removed.	Stream assessment and crossing design in accordance with SCP.	See Section 6.4.1
	Crosses CP Rail Havelock Subdivision. Shrub hedgerow on both sides of line.	CPR	Loss of 0.6 ha of shrub hedgerow. Effects on CPR operations	None. Design will be developed in discussions with CPR. Possible CEAA Screening.	See Section 6.3.5
Crossing of Little Rouge Valley (Approx 250m)	Steep wooded west slope and floodplain, with mixed deciduous/coniferous vegetative community. East bank mixed deciduous forest. Valley providing good wildlife habitat and travel corridor. Valley used for passive recreation.	MNR, MTRC, RPA, DOE, Municipality, Interest Groups, Public	Vegetation removals impacts on wildlife habitat and corridor value. Important to maintain passage for people using the valley for passive recreation. Access roads for bridge construction and maintenance can impact on the valley ecosystem and slope stability.	Bridge will be used to cross the Rouge River thereby minimizing disruption to the vegetation in the valley and maintaining travel corridor for people and wildlife. Where possible, riparian vegetation will be maintained or re-established. Develop access roads to minimize disruption of natural systems and slope stability.	See Section 6.4.1
	Highly significant coldwater fishery with migratory and resident salmonids	MNR, MOEE, MTRC, RPA, DFO, Interest Groups, Public	Potential loss of fish habitat if stream has to be realigned, or if there is instream construction. Runoff, erosion and sedimentation can impact water quality & fish habitat.	Watercourse will be spanned with a bridge. No piers will be placed into the watercourse. Stormwater management and erosion control plans will be developed.	See Section 6.4.1

TABLE 6.6.1

SUMMARY OF CONCERNS/POTENTIAL EFFECTS/PROPOSED MITIGATING MEASURES AND COMMITMENTS TO FURTHER WORK

Location	Environmental Issues/ Concerns	Concerned Group/Agency	Potential Environmental Effects of the Undertaking	Proposed Mitigating Measures, Commitments to Further Work	Comments
Little Rouge Creek to Durham-York Line (Approx. 1.7 km)	Crosses AL 1671, AL 1672, and AL 1673 - all low significance agricultural swales with no fish present.	MNR, MOEE, MTRC, DFO, DOE, Interest Groups, Public	Watercourses may be placed into culverts.	Stream assessment and crossing design in accordance with SCP.	See Section 6.4.1
	Crosses AL-1670 - a low significance warmwater stream with no fish present. Stream is associated with conifer plantation and an old field area.	MNR, MOEE, MTRC, DFO, DOE, Interest Groups, Public	Watercourse may be placed into a culvert. Loss of 1.3 ha conifer plantation (> 55 % white spruce, 15 % red pine, 25 % white pine) and 3.4 ha old field.	Stream assessment and crossing design in accordance with SCP. Impacts minimized through design. Marketable timber will be salvaged.	See Section 6.4.1
	Removal of buildings and displacement of residents.	Residents	Displacement of residents.	Lands in public ownership. Appropriate notice period will be provided per lease agreements.	See Sections 6.4.2
Durham-York Line to West Duffins Creek (Approx. 925m)	Removal of 3 building along Durham-York Line Displacement of residents.	Residents	Displacement of residents.	Lands in public ownership. Appropriate notice period will be provided per lease agreements	See Sections 6.4.2
	Crosses AL 1652 - a low significance agricultural swales with an associated pond.	MNR, MOEE, MTRC, DFO, DOE, Interest Groups, Public	Watercourse may be placed into a culvert. Pond may be removed.	Stream assessment and crossing design in accordance with SCP.	See Section 6.4.1

TABLE 6.6.1

SUMMARY OF CONCERNS/POTENTIAL EFFECTS/PROPOSED MITIGATING MEASURES AND COMMITMENTS TO FURTHER WORK

Location	Environmental Issues/ Concerns	Concerned Group/Agency	Potential Environmental Effects of the Undertaking	Proposed Mitigating Measures, Commitments to Further Work	Comments
West Duffins Creek Valley (Approx. 250m)	Moderately sloping west bank is a mixed forest community. East bank is a mixture of vegetative communities. Valley provides significant wildlife corridor function.	MNR, MTRC, DOE, Interest Groups, Public	Vegetation removals impacts on wildlife habitat and corridor value. Important to maintain passage for people using the valley for passive recreation.	Bridge will be used to cross the Rouge River thereby minimizing disruption to the vegetation in the valley and maintaining travel corridor for people and wildlife. Where possible, riparian vegetation will be maintained or re-established.	See Section 6.4.1
	Crosses AL 1630 - West Duffins Creek - a highly significant coldwater fishery with migratory salmonids.	MNR, MOEE, MTRC, DFO, DOE, Interest Groups, Public	Access roads for bridge construction and maintenance can impact on the valley ecosystem and slope stability.	Develop access roads to minimize disruption of natural systems and slope stability.	See Section 6.4.1
	Crosses AL 1631 - a highly significant coldwater fishery		Potential loss of fish habitat if stream has to be realigned, or if there is instream construction. Runoff, erosion and sedimentation can impact fish habitat.	Watercourses will be spanned with bridges. No piers will be placed into the watercourse. Stormwater management and erosion control plans will be developed.	See Section 6.4.1
West Duffins Valley to North Rd. (Approx. 900m)	Crosses AL 1611 and AL 1610 - both low significance intermittent watercourses with no fish observed.	MNR, MOEE, MTRC, DFO, DOE, Interest Groups, Public	Watercourses may be placed into culverts.	Stream assessment and crossing design in accordance with SCP.	See Section 6.4.1
	Mixed woodlot in north-west quadrant of North Road crossing.	MNR, MTRC, DOE, Interest Groups, Public	Removal of 1.1 ha of woodland providing some habitat for songbirds.	Vegetation removal will be minimized through design.	See Section 6.4.1
	Houses adjacent to North Road outside of right-of-way	MOEE, Residents, Municipality	Increased noise	Detailed noise studies will be carried out during design phase and appropriate mitigating measures will be determined.	See Section 6.4.2

TABLE 6.6.1

SUMMARY OF CONCERNS/POTENTIAL EFFECTS/PROPOSED MITIGATING MEASURES AND COMMITMENTS TO FURTHER WORK

Location	Environmental Issues/ Concerns	Concerned Group/Agency	Potential Environmental Effects of the Undertaking	Proposed Mitigating Measures, Commitments to Further Work	Comments
West Duffins Valley to North Rd. (Cont'd)	Buildings within the right-of- way	Residents, Municipality	Potential loss of farming leases.	Lands in public ownership. Appropriate notice period will be provided per lease agreements.	See Section 6.4.2
	Displacement of residents		Displacement of residents.		
North Rd. to Sideline 24 (Approx. 2.45 km)	Displacement of Seaton Flying Club	Club Members	Loss of recreational facility.	Lands in public ownership. Appropriate notice period will be provided per lease agreements.	See Section 6.4.2
	Crosses AL 1580 & AL 1570 - both low significance agricultural swales with no fish present.	MNR, MOEE, MTRC, DFO, DOE, Interest Groups, Public	Watercourses may be placed into culverts.	Stream assessment and crossing design in accordance with SCP.	See Section 6.4.1
	Crosses AL 1560 - Ganetsekiagon Creek - a low significance intermittent warmwater stream. Downstream sensitivities will need to be considered at design.				
	Buildings within right-of-way. Displacement of tenants	Residents, Municipality	Displacement of residents.	Lands in public ownership. Appropriate notice period will be provided per lease agreements.	See Section 6.4.2
Sideline 24 to Brock Road (Approx. 2.45 km)	.8 ha mature upland forest 325m west of Sideline 24	MNR, MTRC, DOE, Interest Groups, Public	Woodlot may be removed.	Potential for minimizing removals will be reviewed at design stage.	See Section 6.4.1
	5.5 ha unclassified wetland area. Cattails in centre with reed-canary grass on outside.	MNR, MTRC, DFO, DOE, Interest Groups, Public	Wetland may be removed.	Potential for minimizing removals will be reviewed at design stage.	See Section 6.4.1

TABLE 6.6.1

SUMMARY OF CONCERNS/POTENTIAL EFFECTS/PROPOSED MITIGATING MEASURES AND COMMITMENTS TO FURTHER WORK

Location	Environmental Issues/ Concerns	Concerned Group/Agency	Potential Environmental Effects of the Undertaking	Proposed Mitigating Measures, Commitments to Further Work	Comments
Sideline 24 to Brock Road (Cont'd)	Crosses AL 1510 - a low significance intermittent stream with no fish observed. Has a moderately significant mixed woodland providing some corridor connection to the south.	MNR, MOEE, MTRC, DFO, DOE, Interest Groups, Public	Watercourse may be placed into a culvert. Wildlife corridor may be severed.	Stream assessment and crossing design in accordance with SCP.	See Section 6.4.1
	Pickering Rod and Gun Club - historical building	MCzCR, LACAC, Public	Removal of Rod and Gun Club and historical building.	Impacts on historic building will be mitigated in consultation with Markham Heritage & MCzCR. Property in public ownership. Appropriate notice period will be provided.	See Sections 6.4.2 & 6.4.3
	750m vegetated area between Sideline 22 and Country Line consisting of a mix of shrubland, coniferous woodland, mixed woodland and a gravel quarry and unclassified wetland. MNR has indicated that terrestrial vegetation provides east-west wildlife corridor function.	MNR, MOEE, MTRC, DOE, Interest Groups, Public	Encroaches on 9.6 ha of this woodland complex. Potential loss of corridor value.	Corridor value will be reviewed as part of SCP. Potential for minimizing impacts will be reviewed at design stage.	See Section 6.4.1
	Crosses AL 1470 - a moderately significant seasonal warmwater stream with a baitfish fishery.	MNR, MOEE, MTRC, DFO, DOE, Interest Groups, Public	Watercourse may be placed into a culvert.	Stream assessment and crossing design in accordance with SCP.	See Section 6.4.1
	Historic building on Country Line Other residents displaced	MCzCR, LACAC, Public, Residents	Removal of historical building. Other buildings may be removed. Residents displaced.	Impacts on historic building will be mitigated in consultation with Heritage agencies. Property in public ownership. Appropriate notice period will be provided per lease agreements.	See Sections 6.4.2 & 6.4.3

TABLE 6.6.1

SUMMARY OF CONCERNS/POTENTIAL EFFECTS/PROPOSED MITIGATING MEASURES AND COMMITMENTS TO FURTHER WORK

Location	Environmental Issues/ Concerns	Concerned Group/Agency	Potential Environmental Effects of the Undertaking	Proposed Mitigating Measures, Commitments to Further Work	Comments
Sideline 24 to Brock Road (Cont'd)	Crossing of AL 1460 - Urfé Creek - a moderately significant seasonal warmwater stream with a bait fishery. Has moderately steep sloped valley with mixed forest cover. Provides some local corridor function.	MNR, MOEE, MTRC, DFO, DOE, Interest Groups, Public	Potential loss of fish habitat if stream has to be realigned, or if there is instream construction. Access roads for bridge construction and maintenance can impact on the valley ecosystem and slope stability. Runoff, erosion and sedimentation can impact fish habitat. Potential loss of .8 ha of mixed woodland and local wildlife corridor.	Watercourse will be spanned with a bridge. No piers will be placed into the watercourse. Develop access roads to minimize disruption of natural systems and slope stability. Stormwater management and erosion control plans will be developed. Corridor impacts minimized by bridge.	See Section 6.4.1
	Encroachment on cemetery in Brougham	MCCR, MCzCR, Municipality, Public	Cemetery could be encroached upon by Brock Road interchange.	Cemetery will be avoided through the design phase.	
	Historic buildings and residences	MCzCR, LACAC, Municipality, Public	8-10 historic buildings may be removed at Brock Road interchange. Residents displaced.	Impacts on historic building will be mitigated in consultation with Heritage agencies. Property in public ownership. Appropriate notice period will be provided.	See Sections 6.4.2 & 6.4.3
	Noise impacts on Brougham	MOEE, Municipality, Public	Highway is in close proximity to the Hamlet of Brougham - Noise increase.	Detailed noise studies will be carried out during design phase and appropriate mitigating measures will be determined.	See Section 6.4.2

TABLE 6.6.1

SUMMARY OF CONCERNS/POTENTIAL EFFECTS/PROPOSED MITIGATING MEASURES AND COMMITMENTS TO FURTHER WORK

Location	Environmental Issues/ Concerns	Concerned Group/Agency	Potential Environmental Effects of the Undertaking	Proposed Mitigating Measures, Commitments to Further Work	Comments
Brock Road to Highway 7 (Approx. 1.25 km)	Historic buildings and residences	MCzCR, LACAC, Municipality, Public	2 historic buildings may be removed at Brock Road interchange. Other buildings may be removed.	Impacts on historic building will be mitigated in consultation with Heritage agencies. For leases, appropriate notice period will be provided per lease agreement. Private properties will be purchased at fair market value.	See Sections 6.4.2 & 6.4.3
	Crosses AL 1420 - Brougham Creek - a low significance intermittent stream with moderately significant mixed forest	MNR, MOEE, MTRC, DFO, DOE, Interest Groups, Public	Watercourse may be placed into a culvert. Potential loss of 2.3 ha of mixed woodland and local wildlife corridor.	Stream assessment and crossing design in accordance with SCP. Vegetative removal minimized through design.	See Section 6.4.1
	Potential Archaeological Site	MCzCR, LACAC, Municipality	Potential removal of archaic campsite.	Field investigations will confirm location. Encroachment will be minimized through design. Site impacts will be mitigated.	See Section 6.4.3
	Crosses AL 1400 - a low significance intermittent stream with no fish observed	MNR, MOEE, MTRC, DFO, DOE, Interest Groups, Public	Watercourse may be placed into a culvert.	Stream assessment and crossing design in accordance with SCP.	See Section 6.4.1

TABLE 6.6.1

SUMMARY OF CONCERNS/POTENTIAL EFFECTS/PROPOSED MITIGATING MEASURES AND COMMITMENTS TO FURTHER WORK

Location	Environmental Issues/ Concerns	Concerned Group/Agency	Potential Environmental Effects of the Undertaking	Proposed Mitigating Measures, Commitments to Further Work	Comments
Brock Road to Highway 7 (Cont'd)	Potential encroachment on AL 1380 - a highly significant coldwater stream with a highly significant mixed woodland associated with it. Groundwater upwelling area.	MNR, MOEE, MTRC, DFO, DOE, Interest Groups, Public	<p>Potential loss of fish habitat if stream has to be realigned, or if there is instream construction.</p> <p>Access roads for bridge construction and maintenance can impact on the valley ecosystem and slope stability.</p> <p>Runoff, erosion and sedimentation can impact fish habitat.</p> <p>Potential loss of 2.5 ha of mixed woodland and local wildlife corridor.</p>	<p>If watercourse is affected, it will be spanned with a bridge. No piers will be placed into the watercourse.</p> <p>Develop access roads to minimize disruption of natural systems and slope stability.</p> <p>Stormwater management and erosion control plans will be developed.</p> <p>Corridor impacts minimized by bridge.</p> <p>Vegetation removals will be minimized through design.</p>	See Section 6.4.1

APPENDIX 1
EVALUATION CRITERIA

**HIGHWAY 407 TRANSPORTATION CORRIDOR
MARKHAM ROAD - HIGHWAY 7 EAST OF BROCK ROAD
ENVIRONMENTAL ASSESSMENT STUDY**

Factor Group	Factor	Indicator
Natural Environment	Ecosystem Integrity	<p>Severance of/encroachment on identified upland ecosystems.</p> <p>Severance of/encroachment on identified aquatic ecosystems.</p> <p>Severance of/encroachment on identified wetland ecosystems.</p>
	Surface Water Quality and Quantity	<p>Watercourse crossings.</p> <p>Encroachment on headwater areas.</p> <p>Realignment/channelization required.</p> <p>Effects on surface drainage/flood plain.</p> <p>Nature/extent of management programs (MOEE, Conservation Authorities).</p>
	Fisheries (Aquatic Biology)	<p>Warmwater fisheries crossings.</p> <p>Coldwater fisheries crossings.</p> <p>Extent of riparian vegetation removal.</p> <p>Altered/displaced habitat spawning areas.</p> <p>Effects on recreational, rare/endangered/threatened species.</p> <p>Migratory runs affected.</p>

**HIGHWAY 407 TRANSPORTATION CORRIDOR
MARKHAM ROAD - HIGHWAY 7 EAST OF BROCK ROAD
ENVIRONMENTAL ASSESSMENT STUDY**

Factor Group	Factor	Indicator
Natural Environment (cont'd)	Fisheries (Aquatic Biology) (cont'd)	Nature/extent of habitat rehabilitation programs (MNR, Conservation Authorities).
	Vegetation (Terrestrial Biology - to be identified in terms of Vegetation Units)	<p>Degree of access to/encroachment on/severance of identified Environmentally Significant Areas (ESA's) and/or Areas of Natural and Scientific Interest (Life and Earth Science ANSI's).</p> <p>Effects on unique or rare herbaceous species or communities.</p> <p>Degree of encroachment on/severance of woodlots/forest areas.</p> <p>Nature/extent of forest management/ research programs (WIA, plantation, ASA, research plots).</p>
	Wildlife	<p>Effects on wildlife species.</p> <p>Effects on rare/endangered wildlife species.</p> <p>Displaced wildlife habitat.</p> <p>Barrier effects on travel corridors.</p>
	Hydrogeology	Effect on ground water resource areas (high water table, recharge areas, significant overburden aquifers).

**HIGHWAY 407 TRANSPORTATION CORRIDOR
MARKHAM ROAD - HIGHWAY 7 EAST OF BROCK ROAD
ENVIRONMENTAL ASSESSMENT STUDY**

Factor Group	Factor	Indicator
Natural Environment (cont'd)	Hydrogeology (cont'd)	Private/municipal/shallow/deep wells within 150 m of R.O.W.
	Waste Management	Encroachment on abandoned/existing waste sites.
Social Environment	Communities	<p>Encroachment on/severance of established and proposed settlement areas.</p> <p>Influence in defining settlement areas.</p> <p>Residences displaced.</p> <p>Access to/displacement of community facilities (major institutional uses).</p> <p>Delivery of community services (emergency, school bus).</p> <p>Inter-urban and rural-urban barrier effects.</p>
	Recreation	Access to/displacement of recreational uses.
	Visual Aesthetics (View from the facility)	<p>Total aesthetic value of visibly accessible landscape components.</p> <p>Total scenic value based on composition, arrangement and sequence of landscape components.</p>

**HIGHWAY 407 TRANSPORTATION CORRIDOR
MARKHAM ROAD - HIGHWAY 7 EAST OF BROCK ROAD
ENVIRONMENTAL ASSESSMENT STUDY**

Factor Group	Factor	Indicator
Social Environment (cont'd)	Visual Aesthetics (View of the facility)	Total potential visual impact on sensitive viewer groups based on sensitivity, proximity and frequency of viewer groups.
	Noise	<p>Noise sensitive receivers experiencing changes (+/-) in sound levels (5 dB ranges) over pre-existing conditions.</p> <p>Noise sensitive receivers experiencing resultant absolute noise level over 55 dBA.</p>
Economic Environment	Provincial/Municipal Private Land Use Development Strategies	<p>Degree of compatibility with municipal development goals/objectives.</p> <p>Capability to provide transportation service/stimulate development of major development initiatives (Seaton, Pickering Airport).</p> <p>Compatibility with Provincial/Federal planning goals/objectives/policies.</p> <p>Constraints/opportunities for designated settlement area expansion.</p> <p>Population/employment redistribution effects.</p> <p>Effects on approved private development proposals.</p>

**HIGHWAY 407 TRANSPORTATION CORRIDOR
MARKHAM ROAD - HIGHWAY 7 EAST OF BROCK ROAD
ENVIRONMENTAL ASSESSMENT STUDY**

Factor Group	Factor	Indicator
Economic Environment (cont'd)	Non-Farm Commercial Activities	Businesses displaced. Employees displaced. Changes (+/-) in business exposure. Changes in site access/internal circulation.
Agriculture	Physical Resource Consumption	Loss of Class 1 and Class 2 land. Loss of Class 3 and Class 4 land. Total farm property required.
	Facility Resource Consumption	Farm buildings/structures displaced. Specialty crop (rootstocks) displaced. Total owned land required. Improved land required.
	Farm Operation Impacts	Total farm properties directly affected. Livestock operations (field/facility) affected. Specialty operations affected. Farm properties > 20 ha affected.

**HIGHWAY 407 TRANSPORTATION CORRIDOR
MARKHAM ROAD - HIGHWAY 7 EAST OF BROCK ROAD
ENVIRONMENTAL ASSESSMENT STUDY**

Factor Group	Factor	Indicator
Agriculture (cont'd)	Farm Operation Impacts (cont'd)	Severed parcels > 20 ha. Severed parcels < 20 ha. Intra-property movement patterns affected.
	Area Operation Impacts	Transportation routes affected. Division of agricultural community areas.
Cultural Environment	Historical Resources	Features within 100 m of R.O.W. Features within R.O.W.
	Cultural Landscape	Degree of disruption to landscape units.
	Archaeological Resources	Registered sites within R.O.W. Potentially significant sites/resource areas affected.
Transportation and Engineering	Network Configuration and Traffic Service	Interchange conditions. Degree of compatibility with provincial road system (existing/proposed). Degree of compatibility with municipal road system (existing/proposed).

**HIGHWAY 407 TRANSPORTATION CORRIDOR
MARKHAM ROAD - HIGHWAY 7 EAST OF BROCK ROAD
ENVIRONMENTAL ASSESSMENT STUDY**

Factor Group	Factor	Indicator
Transportation and Engineering (cont'd)	Network Configuration and Traffic Service (cont'd)	Degree of compatibility with protection for transit objectives. Degree to which existing/future travel demand is satisfied (Overview Study/ traffic modelling).
	Geometrics	Horizontal alignment (radii/sequence of curves). Vertical alignment (maximum grades and lengths, height of fills and cuts).
	Geotechnical	Potential engineering/environmental problem due to geotechnical conditions. Effects on aggregate resources.
	Staging Options	Ease of construction staging.
	Construction Considerations	Major impacts during construction (road/access closures, detours, utilities/ rail conflicts).
	Cost	Length. Construction cost (earth-works, roadworks, structures). Relocation cost.

**HIGHWAY 407 TRANSPORTATION CORRIDOR
MARKHAM ROAD - HIGHWAY 7 EAST OF BROCK ROAD
ENVIRONMENTAL ASSESSMENT STUDY**

Factor Group	Factor	Indicator
Transportation and Engineering (cont'd)	Cost (cont'd)	Public property affected. Private property affected. Property cost. Construction, utilities and property.

DEFINITIONS OF EVALUATION INDICATORS

Highway 407/Transit (Highway 48 to Highway 35/115), Pickering/Ajax/Whitby Freeway Link and Oshawa/Newcastle Freeway Link Route Planning and Environmental Assessment Studies.

FACTOR GROUP : NATURAL ENVIRONMENT

FACTOR: ECOSYSTEM INTEGRITY

1. Severance of/encroachment on identified upland ecosystems.

Qualitatively assessed based on the area (ha) and type of upland ecosystem (old field, forest and scrub) severed or encroached by the facility. This indicator addresses the synergistic and/or cumulative impact inflicted on the system.

2. Severance of/encroachment on identified aquatic ecosystems.

Qualitatively assessed based on the area (ha) or length (m) of land severed or encroached upon, the number of crossings, the number of rechannelizations and the quality of the crossings and rechannelizations. This indicator addresses the synergistic and/or cumulative impact inflicted on the system.

3. Severance of/encroachment on identified wetland ecosystems.

Qualitatively assessed based on the area (ha) of wetland severed or encroached upon by the facility. This indicator addresses the synergistic and/or cumulative impact inflicted on the system.

FACTOR: SURFACE WATER QUALITY AND QUANTITY

4. Watercourse crossings.

The number of times the right-of-way crosses a watercourse.

5. Encroachment on headwater areas.

The area (ha) of headwater areas located within the right-of-way.

6. Realignment/rechannelization required.

The total length (m) of watercourse that may require realignment/rechannelization.

7. Effects on surface drainage/flood plain.

A qualitative assessment based upon a measure of the flood plain area (ha) within the right-of-way as determined by conservation authority mapping and other available data concerning sensitive features.

8. Nature/extent of management programs (Ministry of the Environment, Conservation Authorities).

This indicator refers to the number and type of Ministry of the Environment, Conservation Authority or other environmental resource programs that a right-of-way could affect.

8a. Stormwater Management.

The potential to accommodate storm water quantity and quality management facilities within the right-of-way.

FACTOR: FISHERIES (Aquatic Biology)

9. Warmwater fisheries crossings.

The number of times the right-of-way crosses a warmwater fisheries watercourse as defined by the Ministry of Natural Resources, Conservation Authorities and field work.

10. Coldwater fisheries crossings.

The number of times the right-of-way crosses a coldwater or potential coldwater fisheries watercourse as defined by the Ministry of Natural Resources, Conservation Authorities and field work.

11. Extent of riparian vegetation removal.

The length (m) or area (ha) of riparian vegetation (which is part of or on the bank of a watercourse), located within the right-of-way.

12. Altered/displaced habitat/spawning areas.

The number/extent (m) including the significance of existing and/or potential spawning or habitat areas within the right-of-way.

13. Effects on recreational, rare/endangered/threatened species.

A qualitative assessment based on known (or potential) species that may be impacted by the right-of-way.

14. Migratory runs affected.

The number of cold or warm water migratory fish runs identified within the right-of-way.

15. Nature/extent of habitat rehabilitation programs (Ministry of Natural Resources, Conservation Authorities).

The number and nature of fisheries rehabilitation projects identified within the right-of-way.

16. Identified upwelling and seepage areas.

Qualitative assessment of the upwelling and seepage areas based on the number and significance of known or potential sites located within the right-of-way (as identified by the Ministry of Natural Resources, Conservation Authorities and field investigations).

FACTOR: VEGETATION

17. Degree of access to/encroachment on/severance of identified Environmentally Significant Areas (ESA's) and/or Areas of Natural and Scientific Interest (Life and Earth Science ANSI's).

The area (ha) of all ESA's and ANSI's, as identified by the Ministry of Natural Resources, the Conservation Authorities or the municipalities in an official plan document, encroached upon/or severed by the right-of-way.

18. Effects on unique or rare herbaceous species or communities.

Qualitative assessment of the effects on unique/rare species based on the area (ha) of habitat located within the right-of-way.

19. Degree of encroachment on/severance of woodlots/forest areas.

The area (ha) of the woodlots/forests located within the right-of-way according to the Ministry of Natural Resources Forest Resource inventory maps and field work. The significance of the impact to woodlots is reported in terms of a low/moderate/high impact based on the type and sensitivity of the woodlot and degree of impact.

20. Nature/Extent of forest management/research programs (WIA, plantation, ESA, research plots).

Qualitative assessment of the forest management/research programs known to be in operation within the right-of-way. The effects are qualitatively described based on the type and extent of the program(s).

FACTOR: WILDLIFE

21. Effects on wildlife species.

Qualitatively described based on known or potential wildlife habitat and species affected and the area of impact keeping in mind the considerations under indicators No. 22 and 23.

22. Effects on rare/threatened or endangered wildlife species.

Potential effects to rare/threatened or endangered wildlife species within the right-of-way.

23. Displaced wildlife habitat.

The area (ha) significance and type of wildlife habitat located within the right-of-way.

24. Barrier effects on travel corridors.

Qualitative assessment of the degree to which the right-of-way acts as a barrier to wildlife travel patterns based on the type of crossing and the number and sensitivity of (potential) habitat areas.

FACTOR: HYDROGEOLOGY

25. Effect on ground water resource areas (high water table, recharge areas, significant overburden aquifers).

The area (ha) of high water table, recharge areas and overburden aquifers potentially affected within the right-of-way.

26. Private/municipal shallow/deep wells within 150 metres of right-of-way.

The number and type of wells within 150 metres of the right-of-way that have been identified by the Ministry of the Environment and by field work.

FACTOR: WASTE MANAGEMENT

27. Encroachment on abandoned/existing waste sites.

The number of abandoned, existing, potential or proposed waste disposal sites and/or potentially contaminated properties located within the right-of-way.

FACTOR GROUP : SOCIAL ENVIRONMENT

FACTOR: COMMUNITIES

28. Encroachment on/severance of established and proposed settlement areas.

Settlement Area

A settlement area shall be defined generally as a cluster or area of concentrated housing or industry, and population. They will be identified through the use of Regional and Local Official Plans and Existing Land Use Maps (as compiled through windshield surveys and/or airphoto interpretation). Settlement areas would also include areas which are similarly defined in the Official Plans, with terms such as hamlets or clusters. In cases where a concentration of housing or industry, and population has not been labelled or defined in those terms, for these purposes a settlement area will be generally defined as follows. A settlement area is recognized as a definable separate entity and is of a size and density so as not to be considered as scattered or strip development.

Qualitative assessment based on the number of settlement areas encroached upon (overlapped), the extent to which the route encroaches upon the area, and whether or not the settlement area is existing (built) or proposed (not yet built, but designated in the Official Plan), will all be considered.

29. Influence in defining settlement areas.

A qualitative assessment of the extent to which the facility would act as a boundary (which did not previously exist) which either prohibits the area from expanding or which helps to better define the settlement area.

30. Residences displaced.

Number of homes within the right-of-way.

31. Access to/displacement of community facilities (major institutional users).

Qualitative assessment based on the removal of or loss of access to community facilities, such as schools and churches.

32. Delivery of community services (emergency, school bus).

Qualitative assessment based on the ability to efficiently and safely provide alternative routes for services, such as school buses, ambulances and fire trucks.

33. Inter-urban and rural-urban barrier effects.

Qualitative assessment based on the extent to which route alternatives create barriers, or physically and psychologically separate parts of communities from other parts of the same community, or from other communities. These barriers may exist as urban/urban, rural/urban, or rural/rural separators.

Existing land use mapping and Regional and Local Official Plans will be used as the source to determine where the route alternatives create these barriers.

FACTOR: RECREATION

34. Access to/displacement of recreational uses.

Qualitative assessment based on the removal of or loss of access to identifiable recreational uses, such as golf courses, riding stables and passive recreational areas such as parks. Private green space and recreational opportunities which are not for public use are not included.

FACTOR: VISUAL AESTHETICS

35. Total aesthetic value of visibly accessible landscape components.

A qualitative assessment based on the number of positive and negative aesthetic elements as well as the quantity and quality of natural and man-made features.

36. Total scenic value based on composition, arrangement and sequence of landscape components.

Qualitative assessment of the variety, accessibility and composition of views/vistas from the road.

37. Total potential visual impact on sensitive viewer groups based on sensitivity, proximity and frequency of viewer groups.

Qualitative assessment of views of the road based on the number and proximity of residences affected and the sensitivity of the viewer group(s).

FACTOR: NOISE

38. Noise sensitive receivers experiencing changes (+/-) in sound levels (5 dBA ranges) over pre-existing conditions.

Number of residences located in a zone or running along either side of the facility that experience increases of 5 dBA or greater from future background ambient levels.

39. Noise sensitive receivers experiencing resultant absolute noise level over 55 dBA.

Number of residences whose resulting levels of noise are greater than 55 dBA as a result of the proposed facility, given in 5 dBA increments (55-60, 60-65, ...) at level of service C traffic conditions.

FACTOR GROUP : ECONOMIC ENVIRONMENT

FACTOR: PROVINCIAL/MUNICIPAL/PRIVATE LAND USE DEVELOPMENT STRATEGIES

40. Degree of compatibility with municipal development goals/objectives.

Qualitative assessment based on the land use policies and proposals as well as more general policies in the Regional and Local Municipal Official Plans.

41. Capability to provide transportation services/stimulate development of major development initiatives (Seaton, Pickering Airport).

A qualitative assessment of the facility's ability to provide transportation services or stimulate planned and projected growth.

42. Compatibility with Provincial/Federal planning goals/objectives/policies.

Qualitative assessment based on compatibility with other Provincial/Federal Planning goals/objectives/policies including those which have not been formally incorporated into the planning process as Policy Statements, or other legislation.

43. Constraints/opportunities for designated settlement area expansion.

The definition of settlement area established in indicator No. 28 shall apply, with the exception that for this indicator only the designated or "proposed" settlement areas which are identified through the Regional and Local Official Plans, but which are not yet built will be used.

Qualitatively assessed taking into account both potential positive and negative effects on a settlement area. It will involve determining (for each route alternative) the extent the route would influence the future expansion or other physical changes in the boundaries of settlement areas.

44. Population/employment redistribution effects.

Qualitative assessment based on the ability of the route alternative to influence the redistribution of population and commerce in the area.

45. Effects on approved private development proposals.

A qualitative assessment of the potential effect of the facility on approved, but not constructed, private development proposals.

FACTOR: NON-FARM COMMERCIAL ACTIVITIES

46. Businesses displaced.

Number of businesses within the right-of-way displaced.

47. Employees displaced.

Number of employees working for businesses displaced within the right-of-way.

48. Changes (+/-) in business exposure.

Qualitative assessment based on improved/reduced visibility of a business due to its proximity to the new facility.

49. Changes in site access/internal circulation.

Qualitative assessment based on loss of access to and within a property or changes necessary to retain access to a property, including unbuilt approved facilities.

FACTOR GROUP : AGRICULTURE

FACTOR: PHYSICAL RESOURCE CONSUMPTION

50. Loss of Class 1 and Class 2 land.

The area (ha) of Class 1 and Class 2 agricultural lands as defined by the Canada Land Inventory for Agriculture (CLI) within the right-of-way.

51. Loss of Class 3 and Class 4 land.

The area (ha) of Class 3 and Class 4 agricultural lands as defined by the Canada Land Inventory for Agriculture (CLI) within the right-of-way.

52. Total farm property required.

The area (ha) of agricultural property that is within the right-of-way.

FACTOR: FACILITY RESOURCE CONSUMPTION

53. Farm buildings/structures displaced.

The number of farm buildings and structures within the right-of-way.

54. Specialty crops (rootstocks) displaced.

The area (ha) and type of specialty crops, such as orchards, berries, market gardens and nursery stock within the right-of-way.

55. Total owned land required.

The area (ha) of agricultural land which is privately owned and operated as a farm within the right-of-way.

56. Improved land required.

The area (ha) of improved land (random or systematic drainage installation as provided in the Agricultural Resource Inventory) within the right-of-way.

FACTOR: FARM OPERATIONS IMPACTS

57. Total farm properties directly affected.

The number of individual farm properties within the right-of-way.

58. Livestock operations (field/facility) affected.

The number and type of livestock operations which produce livestock or livestock products (e.g. milk, eggs) within the right-of-way. These include dairy, beef, hogs, sheep and poultry.

59. Specialty operations affected.

The number and type of specialty operations as defined in indicator No. 54 within the right-of-way.

60. Farm properties greater than 20 ha affected.

The number of individual properties greater than 20 ha within the right-of-way.

61. Severed parcels greater than 20 ha.

The number of parcels greater than 20 ha which are severed from farm property by the right-of-way.

62. Severed parcels less than 20 ha.

The number of parcels less than 20 ha which are severed from farm property by the right-of-way.

63. Intra-property movement patterns affected.

The number of intra-property movements affected, directly related to the number of severances, reflecting the loss of access to portions of a property or significant out-of-way travel.

FACTOR: AREA OPERATION IMPACTS

64. Transportation routes affected.

The number of disturbances to inter-property movements and to property to market movements that are interrupted by the route alternatives.

65. Division of agricultural community areas.

Qualitative assessment based on the potential disruption of established agricultural communities (physical and interactive).

FACTOR GROUP : CULTURAL ENVIRONMENT

FACTOR: HISTORICAL RESOURCES

66. Features within 100 metres of right-of-way.

The number of built heritage features (including designated sites) within 100 metres of the edge of the right-of-way. Includes a qualitative assessment based on type and significance of heritage features.

67. Features with the right-of-way.

The number of built heritage features (including designated sites) within the right-of-way. Includes a qualitative assessment based on type and significance of heritage features.

FACTOR: CULTURAL LANDSCAPE

68. Degree of disruption to landscape units.

Qualitative assessment based on the number of cultural landscape components affected and the extent of the impact. A cultural landscape comprises any discrete aggregation of man-made features, such as built features associated with a watercourse, village core, grouping of farmsteads, etc.

FACTOR: ARCHAEOLOGICAL RESOURCES

69. Registered sites within right-of-way.

The number and type of archaeological sites registered with the Province, within the right-of-way.

70. Potentially significant sites/resource areas affected.

A qualitative assessment based on the number and type of potential archaeological sites, (e.g. landforms/features such as proximity to watersources).

FACTOR GROUP : TRANSPORTATION AND ENGINEERING

FACTOR: NETWORK CONFIGURATIONS AND TRAFFIC SERVICE

71. Interchange conditions.

Interchanges along each alternative, assessed for configuration, skew angle, cuts and fills, environmental and engineering constraints.

72. Degree of compatibility with provincial road system (existing/proposed).

Degree of compatibility with existing and proposed provincial road network (e.g. Highway 401, proposed Highway 407, Highway 7, Highway 7/12, Highway 35/115 and Highway 48), considering traffic operations and required realignments, qualitatively evaluated.

73. Degree of compatibility with municipal road system (existing/proposed).

Degree of compatibility with existing and proposed municipal roads, in terms of :

- roads to be closed;
- road realignments;
- arterial intersection spacing;
- interchange protection at all arterials and traffic operations; and,
- long range municipal initiatives with respect to road network.

This indicator will be qualitatively described based on the elements described above to determine compatibility with municipal road networks.

74. Degree of compatibility with protection for transit objectives.

Degree of compatibility with the proposed Highway 407 transit corridor where applicable. Considerations include differential grading between highway and transit, transit grade criteria, engineering and environmental constraints, and associated construction difficulties/costs.

75. Degree to which existing/future travel demand is satisfied (Overview Study/traffic modelling).

Ability to satisfy existing and future travel demand assessed in terms of traffic demand/orientation compatibility with municipal roads, interchange locations and avoiding directing large traffic volumes through hamlet areas.

FACTOR: GEOMETRICS

76. Horizontal alignment (radii/sequence of curves).

Horizontal alignment characteristics in terms of :

- ratio of total length of curves to total length of tangent;
- number of arterial interchanges on a curve;
- radii used; and,
- number of reverse curves with tangents less than 300 metres.

This indicator will be qualitatively described based on the elements described above to determine a high/moderate/low impact.

77. Vertical alignment (maximum grades and lengths, height of fills and cuts).

Vertical alignment characteristics in terms of :

- maximum grade and its length;
- kilometres of mainline with cut/fill of 5 metres to 10 metres;
- kilometres of mainline with cut/fill greater than 10 metres;
- profile at watercourse crossings; and,
- cross road profile effects.

This indicator will be qualitatively described based on the elements described above to determine a high/moderate/low impact.

FACTOR: GEOTECHNICAL

78. Potential engineering/environmental problems due to geotechnical conditions.

Potential engineering problems due to adverse geotechnical conditions :

- e.g.
- kilometres of mainline through marshland areas;
 - kilometres of mainline through silt and clay deposits (poor bearing soils); and,
 - location of water table, erosion prone areas and foundations conditions.

This indicator will be qualitatively described based on the elements described above to determine potential problems.

79. Effects on aggregate resources.

Aggregate resource areas affected (primary, secondary, tertiary).

FACTOR: STAGING OPTIONS

80. Ease of construction staging.

A qualitative assessment of the degree of ease with which construction would be staged if significant.

FACTOR: CONSTRUCTION CONSIDERATIONS

81. Major impacts during construction (road/access closures, detours, utility/rail conflicts).

Major impacts during construction related to :

- provincial/municipal roadways;
- major utilities;
- arterial roads;
- local access;
- railways; and,
- ease of constructing detours.

This indicator will be qualitatively described based on the elements described above to determine potential impacts.

FACTOR: COST

82. Length.

Length (km) of mainline.

83. Construction cost (earthworks, roadworks, structures).

Construction cost in 1990 dollars of earthworks/roadworks/structures.

84. Relocation cost.

Construction cost in 1990 dollars of arterial and local roads that need to be relocated or closed, and relocation of major utilities (i.e. hydro towers, pipelines, etc.).

85. Public property affected.

Number of properties under public ownership directly affected by right-of-way requirements and local road modifications.

86. Private property affected.

Number of properties under private ownership directly affected by right-of-way requirements and local road modifications.

87. Property cost

Property acquisition costs in 1990 dollars.

88. Construction, utilities and property.

Total capital costs (construction, utilities and property) in 1990 dollars.

APPENDIX 2
WATER QUALITY DATA

Data Source	Maximum Temp. (°C)	Mean Temp. (°C)	Mean Dissolved Oxygen (mg/l)	Mean pH	Mean Turbidity (FTU)	Mean Total Solids (mg/l)	Mean Suspended Solids (mg/l)	Mean Dissolved Solids (mg/l)	Mean Conductivity @ 25°C	Mean Total Phosphorus (mg/l)	Mean Ammonia (mg/l)	Mean Nitrates (mg/l)	Mean TKN (mg/l)	Mean Total Coliforms (Counts/100ml)	Mean Total Strept (Counts/100 ml)
Rouge River															
1987-88 (MPI 1989)	27.5	14.4	10.6	8.2	41.0	586.0	105.7	480.3	733	0.10	0.06	0.72	0.64	1673	617
1987 (MOE unpubl.)	24.0	12.2	9.3	8.1	27.1	457.8		438.3	693	0.05	0.07	0.86	0.60	597	363
1988 (MOE unpubl.)	23.5	11.1	8.8	8.1	26.1	506.1		442.5	773	0.07	0.12	0.86	0.81	346	
Little Rouge Creek															
1987-88 (MPI 1989)	28.0	14.6	11.1	8.3	30.1	469.2	116.2	353.1	535	0.12	0.03	0.76	0.58	2007	558
1987 (MOE unpubl.)	23.5	11.8	9.6	8.0	9.0				588	0.03	0.02		0.51	2664	280
1988 (MOE unpubl.)	24.9	12.3	8.9	8.2	9.0	352.3		337.3	613	0.04	0.06	0.67	0.54	597	
Duffins Creek															
1974-75 (MTC 1976) #29	28.3	10.1	11.9	8.4	14.2	273.0		268.3	417	0.07			0.45	4246	7151
1987 (MOE unpubl.)*	18.0	10.7	9.9	8.2	6.8	521.2		127.1	614	0.20	0.03	0.97	0.75	165	510
1988 (MOE unpubl.)*	16.6	8.5	9.8	8.1	11.1	408.5		13.9	615	0.04	0.05	1.27	0.45		
* Headwater Creek															

APPENDIX 2

Highway 407/Transitway - Markham Road Easterly to Highway 7 East of Brock Road
Environmental Assessment Study

SELECTED WATER QUALITY PARAMETERS FOR MAJOR STUDY AREA WATERCOURSES

1 of 1

APPENDIX 3
LIST OF FISH SPECIES INHABITING
MAJOR STUDY AREA WATERCOURSES

Scientific Name	Common Name	Watercourse		
		Rouge River	Little Rouge Creek	West Duffins Creek
PETROMYZONTIDAE	Lampreys			
<i>Lampetra appendix</i>	American brook lamprey			
CYPRINIDAE	Carp and Minnows			
<i>Campostoma anomalum</i>	central stoneroller		X	
<i>Carassius auratus</i>	goldfish	X		
<i>Clinostomus elongatus</i>	redside dace	X	X	X
<i>Cyprinella spiloptera</i>	spotfin shiner			
<i>Cyprinus carpio</i>	common carp	X		
<i>Notropis cornutus</i>	common shiner	X	X	
<i>Nocomis biguttatus</i>	hornyhead chub		X	
<i>Notropis heterolepis</i>	blacknose shiner			
<i>Notropis rubellus</i>	rosyface shiner			
<i>Notropis stramineus</i>	sand shiner			
<i>Phoxinus eos</i>	northern redbelly dace			

The absence of one or more fish species from one of the study area watercourses does not necessarily mean that they are not found there, only that they were not reported by the data sources reviewed at the Route Planning Phase.

APPENDIX 3

Highway 407/Transitway - Markham Road Easterly to Highway 7 East of Brock Road
Environmental Assessment Study

LIST OF FISH SPECIES INHABITING
MAJOR STUDY AREA WATERCOURSES

Scientific Name	Common Name	Watercourse		
		Rouge River	Little Rouge Creek	West Duffins Creek
<i>Phoxinus neogaeus</i>	finescale dace	X		
<i>Pimephales notatus</i>	bluntnose minnow	X	X	
<i>Pimephales promelas</i>	fathead minnow	X	X	
<i>Rhinichthys atratulus</i>	blacknose dace	X	X	X
<i>Rhinichthys cataractae</i>	longnose dace	X	X	X
<i>Semotilus atromaculatus</i>	creek chub	X	X	X
CATOSTOMIDAE	Suckers			
<i>Catostomus commersoni</i>	white sucker	X	X	X
<i>Hypentelium nigricans</i>	northern hognose sucker		X	
ICTALURIDAE	Bullhead Catfishes			
<i>Ameiurus nebulosus</i>	brown bullhead		X	
<i>Noturus flavus</i>	stonecat		X	

The absence of one or more fish species from one of the study area watercourses does not necessarily mean that they are not found there, only that they were not reported by the data sources reviewed at the Route Planning Phase.

APPENDIX 3

Highway 407/Transitway - Markham Road Easterly to Highway 7 East of Brock Road
Environmental Assessment Study

LIST OF FISH SPECIES INHABITING
MAJOR STUDY AREA WATERCOURSES

Scientific Name	Common Name	Watercourse		
		Rouge River	Little Rouge Creek	West Duffins Creek
SALMONIDAE	Trouts			
<i>Oncorhynchus kisutch</i>	coho salmon	X		X
<i>Oncorhynchus mykiss</i>	rainbow trout	X		X
<i>Oncorhynchus tshawytscha</i>	chinook salmon	X		X
<i>Salmo trutta</i>	brown trout	X	X	X
<i>Salvelinus fontinalis</i>	brook trout	X		X
CYPRINODONTIDAE	Killifishes			
<i>Fundulus diaphanus</i>	banded killifish			
GASTEROSTEIDAE	Sticklebacks			
<i>Culaea inconstans</i>	brook stickleback		X	
COTTIDAE	Sculpins			
<i>Cottus bairdi</i>	mottled sculpin	X	X	X
<i>Cottus cognatus</i>	slimy sculpin			

The absence of one or more fish species from one of the study area watercourses does not necessarily mean that they are not found there, only that they were not reported by the data sources reviewed at the Route Planning Phase.

Scientific Name	Common Name	Watercourse		
		Rouge River	Little Rouge Creek	West Duffins Creek
CENTRARCHIDAE	Sunfishes			
<i>Ambloplites rupestris</i>	rock bass	X	X	
<i>Lepomis gibbosus</i>	pumpkinseed	X		X
<i>Micropterus dolomieu</i>	smallmouth bass		X	X
<i>Micropterus salmoides</i>	largemouth bass	X		
PERCIDAE	Perches			
<i>Etheostoma caeruleum</i>	rainbow darter		X	X
<i>Etheostoma exile</i>	Iowa darter	X		
<i>Etheostoma nigrum</i>	johnny darter	X	X	X
<i>Perca flavescens</i>	yellow perch			
<i>Percina caprodes</i>	logperch			

The absence of one or more fish species from one of the study area watercourses does not necessarily mean that they are not found there, only that they were not reported by the data sources reviewed at the Route Planning Phase.

APPENDIX 4
DESCRIPTION OF SELECTED FEATURES

Areas (ha) are provided only for more or less discrete systems at the respective locations; e.g. area (ha) is not given for stream corridor vegetation as it would be relatively meaningless in most cases because of the considerable length of these systems. Location numbers correspond to the numbers on the terrestrial biology key map. Species composition values provided as percentages usually are taken directly from MNR Forest Resource Inventory (FRI) Maps - 1978, but in some locations FRI values do not accurately depict the present circumstance, due mainly to changes that have occurred since 1978, in which cases the simple presence of species is indicated without a percent value. V/F refers to Vegetation/Forestry, WLD to Wetland, WLF to Wildlife, and OTH to "other" which is either an ESA or Conservation Area. The Location Numbers relate to Exhibit 4.2.1.

Location	Description	Feature				Comments
		V/E	WLD	WLF	OTH	
57	Upland deciduous woods (11 ha), sugar maple (90%), beech (10%)	x		x		High quality upland deciduous stand Moderate wildlife value. Deer habitat
58	Hedgerow of large deciduous trees including red oak, next to nursery operation	x				Very few trees; not classified (MNR) as forest Wildlife value minimal-negligible
59	Mature cedar/white pine woods (approximately 2 ha) attendant to stream	x				Previously much larger, but much removed by commercial nursery operation Minimal wildlife value, diminished by alteration by nursery operation
60	Mature cedar (100%) stream-side forest (13 ha), with some successional hardwoods near Hwy 7	x				Moderate wildlife value, with some corridor value
61	Interrupted drainage woods (4 ha) with some large mature red oak and sugar maple; dense shrubs	x				Minimal wildlife value. Narrow, somewhat isolated corridor of woods

Location	Description	Feature				Comments
		V/F	WLD	WLF	OTH	
62	Southward attenuation of woods (Location 63) along drainage; white elm, some sugar maple	x				Not classified (MNR) as forest
63	Mature upland deciduous woods (4 ha); sugar maple (50%), black cherry (20%), white ash (20%), and beech (10%)	x		x		Minimal wildlife value; small area
64	Successional woods (4 ha) and scrub including willow, poplar, white elm, and Manitoba maple	x				Moderate wildlife value, enhanced by being part of wooded drainage system complex
65	Successional (16 ha) woods along drainage, including white elm	x		x		Minimum wildlife value, diminished by isolation
66	Mixed deciduous woods (4 ha) with some mature trees (e.g., sugar maple), but mostly immature trees and scrub	x				Moderate wildlife value enhanced by being part of wooded drainage system complex
				x		Minimum wildlife value, diminished by isolation

Location	Description	Feature			Comments
		<u>V/E</u>	<u>W/LD</u>	<u>W/LF</u> <u>OTH</u>	
67	Drainage corridor forest of mixed age and species, including cedar, white pine, red oak, sugar maple, and poplar at this location	x		x	Minimal wildlife value, diminished somewhat by being at northern end of corridor
68	Mixed cedar/poplar woods (approximately 8 ha)	x		x	Moderate wildlife value, enhanced by drainage, vegetation and proximity of scrub and old-field habitat
69	Wetland area (5 ha) including pond in old gravel pit		x	x	Moderate wildlife value as pond used by waterfowl and amphibians
70	Lowland mature woods (0.4 ha) including white ash, red maple, basswood, and Manitoba maple	x		x	Not classified (MNR) as forest Minimal-moderate wildlife value. Important locally for deer
71	Cattail marsh (3.5 ha)		x	x	Moderate wildlife value diminished by lack of open water

Location	Description	Feature				Comments
		V/E	WLD	WLF	OTH	
72	Mature upland sugar maple forest (3 ha)	x				Part of more complex wooded area associated with West Duffin Creek system
				x		Moderate wildlife value, enhanced by contiguosness of West Duffin Creek system
73	Valley of West Duffin Creek. Mix of scrub, old-field, mosaics of cedar woods, and successional trees species along creek	x				Wooded areas not classified (MNR) as forest
				x		Major to moderate wildlife value. Beaver and other furbearers use valley, as do deer. Enhanced by habitat diversity
74	Mature maple - beech woodland	x				Not classified (MNR) as forest, but high quality woods
				x		Moderate wildlife value. Deer present

Location	Description	V/E	Feature			Comments
			WLD	WLF	OTH	
75	Mature mixed species upland woods with white ash (50%), basswood (30%), black cherry (10%) and hop-hornbeam (10%). White pine and sugar maple also here. East end associated with scrub including hawthorn and staghorn sumach	x		x		Minimal wildlife value, diminished by isolation
76	Remnant orchard (12 ha) most of which has been removed leaving old field and scrub vegetation	x		x		Not classified as forest (MNR) Minimal wildlife value
77	South area of remnant orchard in Location 76	x		x		Not classified as forest (MNR) Minimal wildlife value. Marginally better than Location 76 because of proximity of West Duffin Creek corridor vegetation

Location	Description	Feature				Comments
		<u>V/E</u>	<u>WLD</u>	<u>WLF</u>	<u>OTH</u>	
78	Valley of West Duffin Creek, mainly cedar woods	x			x	Northern terminus of Whitevale Corridor ESA. MTRCA ESA No. 98 Regionally rare <i>Spiranthes casei</i> recorded from ESA, but not known to be at northern end of ESA. See text Major wildlife value, enhanced by reports (MTRCA) of grouse and deer concentration area. Corridor value high
79	Valley of West Duffin Creek. Corridor vegetation mainly mixed cedar woods; with some scrub and old-field vegetation adjacent	x		x		Major wildlife value. See comments for Location 78
80	White pine plantation (2 ha) with other species mixed; white pine (40%), cedar (30%) and white ash (30%)	x		x		Some inclusion of streamside forest Major to moderate wildlife value, due mainly to enhancement by corridor woods

Location	Description	Feature				Comments
		V/E	WLD	WLF	OTH	
81	Deciduous woods (7 ha), with sugar maple (70%), white ash (30%), and some beech	x		x		Moderate-minimal wildlife value
82	Wooded wetland area (0.5 ha) with red maple, willow, trembling aspen, and much willow shrub associated with woods at Location 81		x			Not great value as a wetland, <u>per se</u> Minimal-moderate wildlife value, enhanced by proximity of mature and successional woods and old-field and scrub
83	Small mature deciduous woods (1.4 ha) with sugar maple, white ash, and basswood, and with red maple near wetland in northern portion of woods Located in northern part of small deciduous woods. Small (0.4 ha) wetland with standing water for much, but not all, of the year	x		x		Not classified (MNR) as forest Moderate wildlife value enhanced by presence of wetland which may be important locally for amphibian reproduction

Location	Description	V/F	Feature			Comments
			WLD	WLF	OTH	
84	Valley of Little Rouge River. Mixed cedar forest at streamside, with mature upland deciduous forest on east bank	x		x		Major wildlife value, enhanced by corridor vegetation
85	Conifer plantation (2 ha) with white spruce and larch	x		x		Minimum wildlife value, diminished by relative isolation
86	Valley of the Little Rouge River. Corridor woods of considerable width (350 m) in this area. Mainly cedar near the stream with mature sugar maple and other deciduous species on the slopes	x		x		Major wildlife value, due to corridor effect and wide expanse of relatively diverse forest habitats
87	Upland mature deciduous woodlot, sugar maple (90%), white pine (10%), with a small grove of large Scot's pine at NE corner	x		x		High quality woodlot moderate wildlife value, diminished somewhat by isolation

Location	Description	V/E	Feature			Comments
			WLD	WLF	OTH	
88	Small (0.4 ha) remnant maple/ beech woodlot that has been encroached upon by adjacent residential development	x		x		Minimal wildlife value, due to small size and proximity of residential property
89	Valley of the Rouge River. Cedar dominant near stream-side on west bank, willows and Manitoba maple on each bank. Ravine slope (west) with larger mature specimens of white ash and sugar maple. Generally diverse woods in this area	x		x		Major wildlife value, habitat diversity and enhanced by proximity of Rouge River

APPENDIX 5
LIST OF VEGETATION AND WILDLIFE



Common Name	Scientific Name
VASCULAR PLANTS	
<u>FERNS</u> Maidenhair Fern	<i>Adiantum pedatum</i>
<u>CONIFERS</u> Balsam Fir White Spruce Norway Spruce Red Pine White Pine Scot's Pine Eastern Hemlock Eastern White Cedar	<i>Abies balsamea</i> <i>Picea glauca</i> <i>P. abies</i> <i>Pinus resinosa</i> <i>P. strobus</i> <i>P. sylvestris</i> <i>Tsuga canadensis</i> <i>Thuja occidentalis</i>
<u>MONOCOTS</u> Common Cattail Grasses Reed Canary Grass Rushes Sedges Ladies-tresses	<i>Typha</i> spp. Family: Gramineae <i>Phalaris arundinacea</i> <i>Scirpus</i> spp. <i>Carex</i> spp. <i>Spiranthes casei</i>

APPENDIX 5

LIST OF PLANTS AND WILDLIFE IDENTIFIED DURING THE ROUTE PLANNING PHASE

Common Name	Scientific Name
<u>DICOTS</u>	
Willows	<i>Salix</i> spp.
Crack Willow	<i>S. fragilis</i>
Populars; Aspens	<i>Populus</i> spp.
Balsam Poplar	<i>Populus balsamifera</i>
Large-toothed Aspen	<i>Populus grandidentata</i>
Trembling Aspen	<i>Populus tremuloides</i>
Yellow Birch	<i>Betula alleghaniensis</i>
White Birch	<i>Betula papyrifera</i>
Blue Beech	<i>Carpinus caroliniana</i>
Hop-hornbeam	<i>Ostrya virginiana</i>
Black Walnut	<i>Juglans nigra</i>
Beech	<i>Fagus grandifolia</i>
Red Oak	<i>Quercus rubra</i>
Bur Oak	<i>Q. macrocarpa</i>
White Elm	<i>Ulmus americana</i>
Hawthorns	<i>Crataegus</i> spp.
Black Cherry	<i>Prunus serotina</i>
European Mountain Ash	<i>Sorbus aucuparia</i>
Staghorn Sumac	<i>Rhus typhina</i>
VASCULAR PLANTS (Continued)	
Red Maple	<i>Acer rubrum</i>
Sugar Maple	<i>A. saccharum</i>
Manitoba Maple	<i>A. negundo</i>
Common Buckthorn	<i>Rhamnus cathartica</i>
Riverbank Grape	<i>Vitis riparia</i>
Basswood	<i>Tilia americana</i>
Red-osier Dogwood	<i>Cornus stolonifera</i>
Ashes	<i>Fraxinus</i> spp.
White Ash	<i>F. americana</i>
Red Ash	<i>F. pennsylvanica</i>
Black Ash	<i>F. nigra</i>
Canada Waterleaf	<i>Hydrophyllum canadense</i>
Richweed	<i>Collinsonia canadensis</i>
Asters	<i>Aster</i> spp.
Goldenrods	<i>Solidago</i> spp.

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Common Name	Scientific Name
MAMMALS	
Short-tailed Shrew	<i>Blarina brevicauda</i>
Common Shrew	<i>Sorex cinereus</i>
Smokey Shrew	<i>Sorex fumeus</i>
Star-nosed Mole	<i>Condylura cristata</i>
Hairytail Mole	<i>Parascalops breweri</i>
Hare	<i>Lepus</i> spp.
Eastern Cottontail	<i>Sylvilagus floridanus</i>
Eastern Chipmunk	<i>Tamias striatus</i>
Eastern Grey Squirrel	<i>Sciurus carolinensis</i>
Woodchuck	<i>Marmota monax</i>
Beaver	<i>Castor canadensis</i>
White-footed Mouse	<i>Peromyscus leucopus</i>
Muskrat	<i>Ondatra zibethicus</i>
Porcupine	<i>Erethizon dorsatum</i>
Coyote	<i>Canis latrans</i>
Red Fox	<i>Vulpes vulpes</i>
Raccoon	<i>Procyon lotor</i>
Mink	<i>Mustela vison</i>
Weasel	<i>Mustela</i> spp.
Striped Skunk	<i>Mephitis mephitis</i>
Whitetailed Deer	<i>Odocoileus virginianus</i>

APPENDIX 5

LIST OF PLANTS AND WILDLIFE IDENTIFIED DURING THE ROUTE PLANNING PHASE

Common Name	Scientific Name
BIRDS	
Canada Goose Mallard Redtailed Hawk Ruffed Grouse American Woodcock Pileated Woodpecker	<i>Branta canadensis</i> <i>Anas platyrhynchos</i> <i>Buteo jamaicensis</i> <i>Bonasa umbellus</i> <i>Scolopax minor</i> <i>Dryocopus pileatus</i>
REPTILES/AMPHIBIANS	
Painted Turtle Garter Snake Red-backed Salamander American Toad Bullfrog Northern Leopard Frog	<i>Chrysemys picta</i> <i>Thamnophis sirtalis</i> <i>Plethodon cinereus</i> <i>Bufo americanus</i> <i>Rana catesbeiana</i> <i>Rana pipiens</i>

APPENDIX 5

LIST OF PLANTS AND WILDLIFE IDENTIFIED DURING THE ROUTE PLANNING PHASE

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APPENDIX 6
KNOWN ARCHAEOLOGICAL SITES

NUMBER	NAME	SITE/TYPE/AFFILIATION/AGE	SIGNIFICANT	RECOMMENDATION
AIGs-5	Simmons	Small camp site	Yes	2
AIGs-21	-	Isolated findspot	No	4
AIGs-22	Sime	Archaic camp site	Yes	2
AIGs-27	Salgo	Archaic camp site	Yes	2
AIGs-29	Pearce	Iroquoian village (Uren) with ossary burials	Yes	1
AIGs-55	Cumby	Isolated findspot	No	4
AIGs-65	Herceg	Isolated findspot	No	4
AIGs-71	Hoar	Iroquoian village (Middleport)	Yes	1
AIGs-72	Roe	Isolated findspot	No	4
AIGs-73	Webb II	Iroquoian village (Middleport)	Yes	1
AIGs-78	Webb I	Iroquoian village (Middleport)	Yes	5
AIGs-82	Hobbs	Isolated findspot	No	4
AIGs-82	Dubois	Isolated findspot	No	4
AIGt-5	Anthony	Burial(s)	Yes	1
AIGt-13	K. Reesor I	Archaic camp site	Yes	2
AIGt-14	K. Reesor II	Iroquoian village (Middleport)	Yes	1
AIGt-19	Burkholder	Woodland camp site	Yes	2
AIGt-24	Armstrong	Woodland camp site	No	Destroyed
AIGt-26	Ralph	Iroquoian ossuary	Yes	1
AIGt-27	J.E. Armstrong	Archaic camp site	Yes	3
AIGt-28	Park	Archaic camp site	Yes	2
AIGt-29	Ansell	Archaic camp site	Yes	2
AIGt-32	White	Iroquoian village	Yes	5
AIGt-34	Pike	Aceramic camp site	Yes	3
AIGt-35	Burkholder II	Iroquoian camp or village	Yes	1

APPENDIX 6

*Highway 407/Transitway
Markham Road Easterly to Highway 7 East of Brock Road
Environmental Assessment Study*

ASSESSED SIGNIFICANCE OF
KNOWN ARCHAEOLOGICAL SITES
IN THE STUDY AREA

NUMBER	NAME	SITE/TYPE/AFFILIATION/AGE	SIGNIFICANT	RECOMMENDATION
AlGt-53	Troyar	Archaic camp site	Yes	3
AlGt-54	Baker	Findspot	No	Destroyed
AlGt-55	Pennock I	Iroquoian ossuary	Yes	1
AlGt-59	Brown	Aceramic findspot	No	4
AlGt-62	Pennock II	Aceramic camp site	Yes	2
AlGt-64	Smitham	Aceramic camp site	Yes	3
AlGt-65	Gostick	Iroquoian village	Yes	1
AlGt-70	Jarvis	Archaic camp site	Yes	3
AlGt-71	McCabe	Archaic camp site	Yes	3
AlGt-98	Balfour	Isolated findspot	No	4
AlGt-102	Calagouri	Isolated findspot	No	4
AlGt-159	Armstrong	Historic deposits	Unknown	3

Recommendation Code:

1. Avoidance or mitigation
2. Further investigations to confirm and evaluate
3. Resurvey area to confirm and evaluate
4. No further investigation
5. Site partially excavated; further excavation required if site is to be impacted

APPENDIX 6

*Highway 407/Transitway
Markham Road Easterly to Highway 7 East of Brock Road
Environmental Assessment Study*

**ASSESSED SIGNIFICANCE OF
KNOWN ARCHAEOLOGICAL SITES
IN THE STUDY AREA**

APPENDIX 7
METHODOLOGY FOR EVALUATING
PLANNING ALTERNATIVES

METHODOLOGY

The Project Team established a procedure for the evaluation which involved an intensive round- table forum conducted over a period of several days to maintain continuity. This procedure initially involved refining the evaluation methodology to ensure that a rational, traceable means of determining the relative advantages, disadvantages and tradeoffs between alternatives was in place.

Weightings were assigned to the evaluation factors to establish their significance for the purpose of rating the alternatives. The weights were developed using a consensus-based decision making process. The factor weightings were presented throughout the course of the study in a graphical representation of relative, non-numerical "factor significance ratings". Exhibit A7-1 shows the Factor Weigtings.

To maintain continuity with the route development phase, the route alternatives for the Study Area were evaluated from west to east.

Route alternative links (discrete portions of route alternatives defined by intersection points with other route alternatives) were aggregated to form route alternative segments (series of route alternative links). For comparison purposes, the route alternative segments were paired based on common end points which were generally related to the screenlines separating the major Study Area sections. Link S1 (Highway 48 to Ninth Line) was excluded from the comparative analysis and evaluation since it is considered to be the only viable option in this part of the Study Area and is, therefore, common to all routing options.

Due to the number of route alternatives under consideration in each section, a staged evaluation procedure was employed.

Land use and natural environmental sensitivities across the study area vary considerably. It was deemed necessary and most efficient to conduct a step-wise sequence of focused/localized comparative assessments to account for these differences, rather than comparing route alternatives over the full extent of the study area.

The paired route segments under consideration at each stage were rated (scored) by each team member relative to the 88 indicators. The scoring of alternatives for each indicator was based on a "10 point must" system whereby the alternative which best satisfied the project objectives received a score of 10, with the other being indexed from 0 to 10. These scores were determined by individual team members initially but were recorded as a consensus rating following extensive detailed discussion. Similarly, consensus ratings for each of the 26 factors were derived (using the same "10 point must"

APPENDIX 7

METHODOLOGY FOR EVALUATING ROUTE ALTERNATIVES

system) based on the scores for the indicators.

Following the comparative review of the paired route alternative segments, further discussion of the advantages and disadvantages of each segment occurred, with each team member indicating their preference and providing the associated rationale. Based on this discussion, a consensus on the preferred option emerged and was recorded. The preferred option was carried forward to a subsequent stage while the other option was eliminated from further consideration, except where it was retained to be assessed as part of another route segment comparison. The process involved a continuous review of the initial evaluation sequence and route segment composition based on the results of each evaluation stage; adjustments were made where appropriate.

The established factor weightings were subsequently applied to the factor scores, which were then totalled and recorded. The total weighted scores were tabled for observation and comparison with the preferred option which had been selected using the aforementioned procedure. This procedure served primarily for verifications of the selection but was also intended to provide an additional opportunity for discussion, should inconsistencies between the rational selection and the weighted scores occur.

The final step at each evaluation stage involved the summary recording of individual team members' preferences, the consensus preference, the weighted scores and a brief outline of the rationale for the consensus selection.

It is emphasized that throughout the evaluation process, the numerical scoring/rating of alternatives was used primarily as a means of focusing on and enhancing a rational decision making process and verifying selections made on the basis of best professional judgment.

APPENDIX 7

METHODOLOGY FOR EVALUATING ROUTE ALTERNATIVES




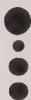








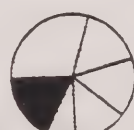
FACTOR GROUP/FACTOR	FACTOR SIGNIFICANCE RATING	HIGH 	FACTOR GROUP SIGNIFICANCE RATING
NATURAL ENVIRONMENT Ecosystems Surface Water Fisheries Vegetation Wildlife Hydrogeology Waste Management			
SOCIAL ENVIRONMENT Communities Recreation Aesthetics Noise			
ECONOMIC ENVIRONMENT Land Use Non-Farm Communities			
AGRICULTURE Physical Resources Facility Resources Farm Operations Area Operations			
CULTURAL ENVIRONMENT Historical Archaeological Cultural Landscape			
TRANSPORTATION AND ENGINEERING Network/Service Geometrics Geotechnical Staging Construction Considerations Cost			

EXHIBIT A7-1
EVALUATION FACTOR SIGNIFICANCE RATING

APPENDIX 7

**METHODOLOGY FOR EVALUATING
ROUTE ALTERNATIVES**

APPENDIX 8
RATIONALE FOR SELECTING
ROUTE ALTERNATIVES

RATIONALE FOR SELECTING ROUTE ALTERNATIVES

This appendix describes the rationale for selecting the route alternatives that are evaluated in Chapter 5 of this report. The limits of each section and node location referred to herein is shown on Exhibit 5.5.1 (Chapter 5).

1. West Section - Ninth Line (Markham) to Pickering Airport Site/Seaton Community

From Ninth Line to just east of Green River, two basic corridors were developed: South and Centre with a cross-over link between them.

South Corridor (Node A to D)

Two routes were developed in the southern corridor, one (S3) which passes south of Locust Hill and one (S2 + S4) which passes north of Locust Hill. Both then bypass Green River to the south.

The major controls in establishing a southern route in the western section of the study area were the locations of Locust Hill, the Whitevale Corridor Environmentally Sensitive Area (ESA) north of Whitevale and the East Markham (Cornell) Study Area (Lots 11-15 Concession 9). In order to avoid significant impact to the Whitevale Corridor ESA, and maintain a buffer distance from Green River, the south route had to cross West Duffins Creek a quarter concession south of Highway 7.

The route passing south of Locust Hill (S3) is a tangential extension of Link S1. East of Locust Hill, Link S3 directs the Highway in a northeast direction to cross West Duffins Creek at the quarter concession point south of Highway 7. Link S3 is entirely within provincially owned (ORC) lands. The selection of this route would necessitate a realignment of Highway 7 to obtain favourable highway design geometrics while allowing for an Interchange with the Durham/York Line.

The alternative to the above route (S2+S4) was located to minimize the encroachment on the East Markham Study Area (Cornell) while bypassing Locust Hill to the north. The route runs northeast from Ninth Line and turns east, north of Locust Hill, running approximately equidistant between Locust Hill and Green River, crossing West Duffins Creek at the quarter concession point. This alignment would require the acquisition of privately owned properties in the vicinity of Highway 7 and Tenth Line.

Several conceptual schemes were developed for a Highway 407 fully directional interchange with a north-south freeway on the present Markham Bypass location. The objective was to ensure that the

APPENDIX 8

Highway 407 Alternatives would not preclude such a directional interchange. Subsequent to the development and review of the above conceptual interchange layouts, the Provincial Government announced the implementation of the Rouge Valley Park and associated modifications to the transportation initiatives in the area in March 1990. This precluded a north-south freeway in the Markham Bypass vicinity.

Centre Corridor (Node A to B/C)

One route was developed in the Centre Corridor to pass to the north of Locust Hill and Green River (C1). East of Green River, two short links were developed to connect with the two Centre Corridor alternatives in the Central Section. Link C9 provides the connection to the more southerly route (quarter concession north of Highway 7) (Node C) and Link C11 connects with the more northerly, half concession route (Node B).

Passing to the north of both Locust Hill and Green River, Link C1 is a tangential extension of Link S2 and follows a long tangent to align itself to connect with the two Centre Corridor routes in the Central Section. Link C1 offers the only alternative to pass north of Green River and, therefore, completely avoid the Whitevale Corridor ESA. Link C1 also passes south of a significant woodlot north of Green River.

Cross-over

One cross-over route was developed (SC1) to allow one of the south corridor routes to be utilized to east of Greenwood and then connect to the Centre Corridor to cross Pickering.

This alignment extends tangentially to the northeast from Link S3. It provides an opportunity to go north of Seaton and to serve the Pickering Airport lands. Link SC1 is located entirely on government owned lands. Of consideration in locating this link were the Brunswick Hill Cemetery, the present location of the Pickering Hydro distribution station, and the recommended Seaton water reservoir locations along Highway 7.

2. Central Section - Pickering Airport/Seaton Community to West of Brooklin

Through the Central Section, there are two basic corridors: the South Corridor, which goes through the 5th Concession and the Centre Corridor which goes through the 6th Concession. Two cross-overs were developed to cross from the South Corridor to the Centre Corridor.

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South Corridor (Node D to F)

The southern route continues easterly in the 5th Concession in Pickering and connects with Brock Road south of the Hamlet of Brougham. The Hamlet of Brougham was the major control in establishing a linear southern route within this section. The most desirable southern route is a tangential continuation of Link S4, a quarter concession south of Highway 7 (5th Concession).

This alignment is the most acceptable southern option with respect to both natural environment and land use elements. Environmental concerns in Concession 5 include coldwater tributaries to Duffins Creek and the associated forest and wildlife areas.

A route at quarter concession allows for a long tangential alignment from north of the Whitevale Corridor ESA to Brock Road. This route would define the southern limits of expansion for Brougham. Also, the Town of Pickering concept for the Seaton Community suggests that Highway 407 should act as a separator between the industrial developments to the north and the residential areas to the south. However, the alignment would affect a significant registered archaeological site, namely the Salgo Site.

Centre Corridor (Node B/C to E)

The Centre Corridor offers a route north of Highway 7 through the Pickering Airport Site. There are two routes in the western half of the Central Section through the Pickering Airport Site lands: one at a quarter concession (C10) and one at a half concession (C2+C3) north of Highway 7. The two routes converge into one just east of Brougham. The major control in establishing an east-west alternative through Concession 6 in Pickering was the northern limits of Brougham; the residential developments along Sideline 16; and the potential development of the Pickering Airport Site.

For the mid-concession alternative (C2+C3), a route immediately south of mid-concession had the least impact on identified constraints. The route swings south of the mid-concession alignment east of Brougham to avoid residential development along Paddock Road and a significant woodlot in Lots 15 and 16. This alignment swing to the south involved measurable tradeoffs between capital intensive agricultural operations (e.g., nursery versus livestock operations).

The quarter concession alternative, Link C10, was developed as an option to Links C2+C3 in response to discussions with Transport Canada. Transport Canada indicated that they preferred a route at quarter concession north of Highway 7, as opposed to half concession north of Highway 7, to optimize potential for peripheral non-airport land uses on the airport site and avoid possible conflicts with conceptual runway orientation near Brougham. A significant disadvantage of Link C10 is that an interchange at Brock Road will require displacement of the strip of houses in the

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Hamlet owned by Public Works Canada along Old Brock Road.

The development of these route options involved consideration of potential impacts to natural and heritage features, which are similar for both options, and publicly and privately owned agricultural operations.

Cross-overs

Two cross-overs were developed, one on the west side of Brougham (SC2) and the other on the east side (SC3), to connect the South Corridor to the Centre Corridor.

The cross-over west of Brougham offers a northern bypass of the existing and proposed developments in Concession 5. This option is located entirely within government lands.

A cross-over east of Brougham (SC3) has the advantage that Brougham would be separated from development to the south and traffic on Brock Road seeking Highway 407 would not have to travel through the hamlet. Also, with a cross-over east of Brougham, the Highway 407 route would avoid the PWC lands and, therefore, not conflict with Federal airport development initiatives. However, the tradeoff with this option involves encroachment on a major agribusiness operation.

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*Highway 407/Transitway
Markham Road Easterly to East of Brock Road
Environmental Assessment Study*

RATIONALE FOR SELECTING
ROUTE ALTERNATIVES

**APPENDIX 9
COMPARISON TABLE OF
POTENTIAL IMPACTS STAGE 1**

FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
		C1 + C11 North of Green River	S4 + S4/SC1 + SC1 + SC6 South of Green River
NATURAL ENVIRONMENT <i>Ecosystem Integrity</i>	<ul style="list-style-type: none"> Severance of/encroachment on identified upland ecosystems (ha) Severance of/encroachment on identified aquatic ecosystems (ha) Severance of/encroachment on identified wetland ecosystems (ha) 	<ul style="list-style-type: none"> No impacts identified Crosses Little Rouge Creek system north of Locust Hill; West Duffin Creek System north of Green River No impacts identified 	<ul style="list-style-type: none"> No impacts identified Crosses Little Rouge Creek system north of Locust Hill; West Duffin Creek System south of Green River No impacts identified
	<ul style="list-style-type: none"> Watercourse crossings (number) Encroachment on headwater areas (ha) Realignment/channelization required (m) Effects on surface drainage/flood plain (qualitative) Nature/extent of management programs (MOE, Conservation Authorities) (qualitative) 	<ul style="list-style-type: none"> 3, 3 permanent 400 ha 270 m 2 intermittent watercourses flow through area of high fill for York Road 30 interchange MTRC Rouge River Creek and West Duffin Creek Watershed/Basin Management Strategies 	<ul style="list-style-type: none"> 2, 2 permanent 0 ha 0 m No impacts identified MTRC Rouge River Creek and West Duffin Creek Watershed/Basin Management Strategies
	Surface Water Quality and Quantity		

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Highway 407/Transitway-Markham Road Easterly to Highway 7 East of Brock Road
Environmental Assessment Study

SUMMARY COMPARATIVE ANALYSIS OF STAGE 1 ROUTE SEGMENTS 1 OF 12

FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
		C1 + C11 North of Green River	S4 + S4/SC1 + SC1 + SC6 South of Green River
<i>Fisheries (Aquatic Biology - to be identified in terms of stream crossing number)</i>	<ul style="list-style-type: none"> Warmwater fisheries (number) Coldwater fisheries (number) 	<ul style="list-style-type: none"> 0 3, Little Rouge Ck (#7), Major Ck (#11), West Duffin Ck (#12) 	<ul style="list-style-type: none"> 0 2, Little Rouge Ck (#7), West Duffin Ck (#13)
	Extent of riparian vegetation removal (m)	160 m. Mature vegetation displaced on Little Rouge Creek	360 m. Dense mature mixed forest at West Duffin Creek
	Altered/displaced habitat/spawning areas (m)	No impacts identified	No impacts identified
	Effects on recreational, rare/endangered/threatened species (number/qualitative)	6, 3 regionally/provincially (Stoneroller, Hornyhead Chub, Stonecat), 1 nationally threatened (Redside Dace). 2 recreational (Brook, Brown Trout)	6, 3 regionally/provincially (Stoneroller, Hornyhead Chub, Stonecat), 1 nationally threatened (Redside Dace). 2 recreational (Brook, Brown Trout)
	Migratory runs affected (number)	1 Salmonid Run (#7)	1 Salmonid Run (#7)
	Nature/extent of habitat rehabilitation programs (MNR, Conservation Authorities) (qualitative)	MTRC Riparian Protection and Enhancement Plan for Little Rouge Creek and West Duffin Creek	MTRC Riparian Protection and Enhancement Plan for Little Rouge Creek and West Duffin Creek
	Identified upwelling and seepage areas (number/qualitative)	1 moderately high	1 high

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FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
		C1 + C11 North of Green River	S4 + S4/SC1 + SC1 + SC6 South of Green River
<i>Vegetation (Terrestrial Biology - to be identified in terms of Vegetation Units)</i>	<ul style="list-style-type: none"> Degree of access to/encroachment on/severance of identified Environmentally Significant Areas (ESA's) and/or Areas of Natural and Scientific Interest (Life and Earth Science ANSI's) (ha) 	<ul style="list-style-type: none"> No impacts identified 	<ul style="list-style-type: none"> No impacts identified
	<ul style="list-style-type: none"> Effects on unique or rare herbaceous species or communities (type) 	<ul style="list-style-type: none"> No impacts identified 	<ul style="list-style-type: none"> No impacts identified
	<ul style="list-style-type: none"> Degree of encroachment on/severance of woodlots/forest areas (ha displaced/total ha (if available)) 	<ul style="list-style-type: none"> Units 72 (0.3 ha/3), 73 (1 ha), 84 (9 ha): 10.3 ha including cedar woods and successional species of West Duffins Creek valley, mature maple-beach forest, and mixed cedar along Little Rouge Creek. 	<ul style="list-style-type: none"> Units 79 (1.5 ha), 80 (1 ha/2), 81 (0.5 ha/7), 83 (1.4 ha/1.8), 84 (7.8 ha): 12.2 ha including mixed cedar, mature deciduous, small white pine plantation, hawthorn and successional woody growth.
	<ul style="list-style-type: none"> Nature/extent of forest management/research programs (WIA, plantation, ASA, research plots) (qualitative) 	<ul style="list-style-type: none"> Minor. Unit 84: Plantings of white spruce along Little Rouge Creek; some walkways mowed by area owner/tenant. 	<ul style="list-style-type: none"> Minor. Units 84: scattered plantings of white spruce; some walkways mowed by landowner; 2 ha white pine plantation in Unit 80

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Highway 407/Transitway-Markham Road Easterly to Highway 7 East of Brock Road
Environmental Assessment Study

SUMMARY COMPARATIVE ANALYSIS OF
STAGE 1 ROUTE SEGMENTS
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FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
		C1 + C11 North of Green River	S4 + S4/SC1 + SC1 + SC6 South of Green River
<i>Wildlife</i>	● Effects on wildlife species (qualitative)	● Major disruption of greenland corridors along Little Rouge and West Duffins, containing highly diverse forest and habitat.	● Major disruption of greenland corridors along Little Rouge and West Duffins, containing highly diverse forest and habitat.
	● Effects on rare/endangered wildlife species (number/qualitative)	● Unit 73: regionally uncommon beaver habitat encountered	● No impacts identified
	● Displaced wildlife habitat (ha displaced/total ha (if available))	● Units 72 (0.3 ha/3), 73 (4.5 ha), 84 (9 ha): 13.8 ha.	● Units 77 (3 ha/12), 79 (2.8 ha), 80 (1 ha/2), 81 (0.5 ha/7), 82 (0.5 ha/0.5), 83 (0.2 ha/1.8), 84 (7.8 ha): 15.8 ha.
	● Barrier effects on travel corridors (qualitative)	● Major. Wide area of severance in valuable corridors along Little Rouge and West Duffins for deer and furbearers (beaver, mink, muskrat).	● Major. Wide area of severance in valuable corridors along Little Rouge and West Duffins for deer and furbearers (beaver, mink, muskrat).
<i>Hydrogeology</i>	● Effect on groundwater resource areas (high water table, recharge areas, significant overburden aquifers) (ha)	● 49.6 ha, 103.8 ha, 0 ha	● 95.4 ha, 86 ha, 0 ha
	● Private/municipal shallow/deep wells within 150 m of ROW (number)	● 6 wells - 4 drilled, 2 deep bored	● 3 wells - deep bored
<i>Waste Management</i>	● Encroachment on abandoned/existing waste sites (number)	● No impacts identified	● No impacts identified

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FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
		C1 + C11 North of Green River	S4 + S4/SC1 + SC1 + SC6 South of Green River
SOCIAL ENVIRONMENT <i>Communities</i>	● Encroachment on/severance of established and proposed settlement areas (qualitative)	● No impacts identified	● Encroachment on Seaton Lands south of Green River
	● Influence in defining settlement areas (qualitative)	● Highly influential, reinforces north limit of Locust Hill and south limit of Green River, also defines north Seaton	● Highly influential, reinforces north limit of Locust Hill and south limit of Green River, also defines north Seaton
	● Residences displaced (number)	● 8 residences	● 9 residences
	● Access to/displacement of community facilities (major institutional uses) (qualitative)	● No impacts identified	● No impacts identified
	● Delivery of community services (emergency, school bus) (qualitative)	● Low. 6 bus routes disrupted	● Low. 4 bus routes, 1 regional road disrupted
	● Inter-urban and rural-urban barrier effects (qualitative)	● No impacts identified	● No impacts identified
<i>Recreation</i>	● Access to/displacement of recreational uses (qualitative)	● Encroaches on Green River fairgrounds, low potential to effect Little Rouge Creek Valley & West Duffins Creek Valley	● High potential to displace Seaton Hiking Trail and Seaton Flying Club at West Duffins Creek Valley

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Highway 407/Transitway-Markham Road Easterly to Highway 7 East of Brock Road
Environmental Assessment Study

SUMMARY COMPARATIVE ANALYSIS OF
STAGE 1 ROUTE SEGMENTS
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FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
		C1 + C11 North of Green River	S4 + S4/SC1 + SC1 + SC6 South of Green River
<i>Visual Aesthetics</i> (View from the facility)	• Total aesthetic value of visibly accessible landscape components (qualitative/scenic value)	• Features with Little Rouge & West Duffins Creek, + 2 aesthetic vegetation, attractive landscape; moderate value (+ 2)	• Aesthetic vegetation in Little Rouge & West Duffins Creek, (+ 1) rolling fields; moderate (+ 2)
	• Total scenic value based on composition, arrangement and sequence of landscape components (qualitative/scenic value)	• Flat landscape with straight alignment, and slight curve provides view of scenic North side; moderate value (+ 2)	• Limited variety of view, long radius curve offers some views to the north; moderate (+ 2)
	• Total potential visual impact on sensitive viewer groups based on sensitivity, proximity and frequency of viewer groups (qualitative/scenic value)	• Alignment along north side of Locust Hill community; moderate negative value (-3)	• Alignment close to Green River community (-3)
<i>Noise</i>	• Noise sensitive receivers experiencing changes (+/-) in sound levels (5 dB intervals) over pre-existing conditions (number)	• 8 residences impacted, 1 (5-10 db), 2 (10-15 db), 3 (15-20 db), 2 (>20 db)	• 8 residences impacted, 5 (5-10 db), 1 (10-15 db)
	• Noise sensitive receivers experiencing resultant absolute noise level over 55 db (number)	• 8 residences impacted, 2 (55-60 db), 1 (60-65 db), 1 (65-70 db), 4 (65-70 db)	• 3 residences impacted, 1 (55-60 db), 1 (60-65 db), 1 (65-70 db),

FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
ECONOMIC ENVIRONMENT <i>Provincial/Municipal/Private Land Use Development Strategies</i>	<ul style="list-style-type: none"> Degree of compatibility with municipal development goals/objectives (high/moderate/low) Capability to provide transportation service/stimulate development of major development initiatives (Seaton, Pickering Airport) (high/moderate/low) Compatibility with Provincial/Federal planning goals/objectives/policies (high/moderate/low) Constraints/opportunities for designated settlement area expansion (qualitative) Population/employment redistribution effects (qualitative) 	C1 + C11 North of Green River	S4 + S4/SC1 + SC1 + SC6 South of Green River
		<ul style="list-style-type: none"> Low, not compatible with Durham OP and Pickering's land use objectives, pressure for non-agricultural uses in East Markham, create impetus for growth of Locust Hill and Green River beyond designated limits High, favours federal Pickering Lands, good service for potential peripheral airport-related development Moderate degree of compatibility with preliminary proposals for airport runway configurations, minimizes impact to linear greenland corridors and agricultural land High, exposes Green River to economic possibilities associated with Seaton and potential airport-related developments in federal Pickering Lands; convenient freeway access at York Rd 30 and Hwy 7 Moderate redistribution of employment opportunities from Seaton to federal Pickering Lands; potential integration of services of 	<ul style="list-style-type: none"> Low, not compatible with Durham OP and Pickering's land use objectives, pressure for non-agricultural uses in East Markham, create impetus for growth of Green River but does provide desired buffer between Seaton and Green River High, favours federal Pickering Lands, good service for potential peripheral airport-related development Moderate degree of compatibility with preliminary proposals for airport runway configurations, minimizes impact to linear greenland corridors and agricultural land Moderate, convenient freeway access to Green River from York Rd 30 and Hwy 7; York Rd 30 I/C potential node of stimulus for both Locust Hill and Green River Moderate redistribution of employment opportunities from Seaton to federal Pickering Lands, potential to draw employment

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Highway 407/Transitway-Markham Road Easterly to Highway 7 East of Brock Road
Environmental Assessment Study

SUMMARY COMPARATIVE ANALYSIS OF
STAGE 1 ROUTE SEGMENTS
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FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
		C1 + C11 North of Green River	S4 + S4/SC1 + SC1 + SC6 South of Green River
<i>Non-Farm Commercial Activities</i>	• Businesses displaced (number)	• No impacts identified	• 1 business. Relatively significant in area as local employer
	• Employees displaced (number)	• No impacts identified	• 8 employees,
	• Changes (+/-) in business exposure (qualitative)	• Moderate, some reduction in regional traffic for businesses on Hwy 7 in Locust Hill and Green River, increase on York Rd 30	• Moderate, some reduction in regional traffic for businesses on Hwy 7 in Locust Hill and Green River, increase on York Rd 30
	• Changes in site access/internal circulation (qualitative)	• No impacts identified	• 1 business loss of property
AGRICULTURE <i>Physical Resource Consumption</i>	• Loss of Class 1 and Class 2 land (ha)	• 136.3 ha, mix of Class 1 with no limitations and Class 2 with topographic limitations at West Duffin Creek	• 136.2 ha, 75-95% Class 1, no limitations. Some Class 2 with topographic limitations at West Duffin Creek
	• Loss of Class 3 and Class 4 land (ha)	• No impacts identified	• No impacts identified
	• Total farm property required (ha)	• 86.6 ha	• 9.6 ha
<i>Facility Resource Consumption</i>	• Farm buildings/structures displaced (number/quality)	• No impacts identified	• 11, 4 houses, 5 barns, 1 horse track, 1 silo (tenant occupied on ORC lands)
	• Specialty crop (rootstocks) displaced (type/ ha)	• No impacts identified	• No impacts identified
	• Total owned land required (ha)	• No impacts identified	• No impacts identified
	• Improved land required (ha)	• No impacts identified	• No impacts identified

FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
		C1 + C11 North of Green River	S4 + S4/SC1 + SC1 + SC6 South of Green River
<i>Farm Operation Impacts</i>	<ul style="list-style-type: none"> Total farm properties directly affected (number) Livestock operations (field/facility) affected (number/type) Specialty operations affected (number/type) Farm properties > 20 ha affected (number) Severed parcels > 20 ha (number) Severed parcels < 20 ha (number) Intra-property movement patterns affected (number) 	<ul style="list-style-type: none"> 7, 4 cash crop, 1 dairy, 1 horse, 1 beef. 3, 1 dairy, 1 horse, 1 beef No impacts identified 6 properties 5 properties 3 properties 4, 1 severance landlocked 	<ul style="list-style-type: none"> 4, 3 cash crop, 1 beef. 1, beef No impacts identified 2 properties 3 properties 3 properties 5, 1 severance landlocked
	<i>Area Operation Impacts</i>	<ul style="list-style-type: none"> Transportation routes affected (number) Division of agricultural community areas (number) 	<ul style="list-style-type: none"> 4, York Road 30, Sidelines 30, 32 and 28 Division of Community integrity in East Markham/West Pickering. Some separation of hamlets of Locust Hill/Green River from agricultural hinterland
CULTURAL ENVIRONMENT <i>Historical Resources</i>	<ul style="list-style-type: none"> Features within 100 m of ROW (exceptional/moderate/ordinary) Features within ROW (exceptional/moderate/ordinary) 	<ul style="list-style-type: none"> 4, 1 ordinary residence, 1 moderate residence, 2 ordinary farms 1, 1 ordinary residence 	<ul style="list-style-type: none"> 2, 1 moderate residence, 1 moderate farm 3, 2 ordinary residences, 1 moderate residence

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FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
		C1 + C11 North of Green River	S4 + S4/SC1 + SC1 + SC6 South of Green River
<i>Cultural Landscape</i>	<ul style="list-style-type: none"> Degree of disruption to landscape units (major/moderate/minor) 	<ul style="list-style-type: none"> Moderate, rural lands with heritage sites and historical settlements (West Duffin Creek Valley), well established landscape, close proximity to hamlet of Green River 	<ul style="list-style-type: none"> High, agricultural lands, heritage sites and historical settlements of Green River and Whitevale
<i>Archaeological Resources</i>	<ul style="list-style-type: none"> Registered sites within ROW (number/type) Potentially significant sites/resource areas affected (number/type) 	<ul style="list-style-type: none"> 1 site, Pike Site (AIGt-34, Aceramic campsite, significant) 2 sites, Pennock Site I(AIGt-55, Iroquoian burial area, significant), Pennock Site II(AIGt-62, Aceramic campsite, significant) both within 100m of ROW, encroaches on historically recorded pine stand 	<ul style="list-style-type: none"> 1 site, Brown Site (AIGt-59, Aceramic findspot, not considered significant) 2 sites, Park Site (AIGt-28, Archaic campsite, significant), Herceg Site (AIGt-65, isolated findspot, not significant) both within 100m of ROW, encroaches on historically recorded pine stand

FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
		CI + CII North of Green River	S4 + S4/SC1 + SC1 + SC6 South of Green River
TRANSPORTATION AND ENGINEERING <i>Network Configuration and Traffic Service</i>	<ul style="list-style-type: none"> Interchange conditions (qualitative) 	<ul style="list-style-type: none"> Fair. All standard interchanges except a 60° skew interchange with RR30. West Duffin Crk. 	<ul style="list-style-type: none"> Good. All standard interchanges except 60° skew interchange with North Road
	<ul style="list-style-type: none"> Degree of compatibility with provincial road system (existing/proposed) (high/moderate/low) 	<ul style="list-style-type: none"> Moderate. RR30 I/C in close proximity to Hwy 7 	<ul style="list-style-type: none"> Moderate. Limited flexibility to relocate Hwy 7 south of Green River
	<ul style="list-style-type: none"> Degree of compatibility with municipal road system (existing/proposed) (high/moderate/low) 	<ul style="list-style-type: none"> High. I/C at RR30 and at Sideline 30 (presently local roads) 	<ul style="list-style-type: none"> High. Sideline 34 closed, I/C at Sideline 30
	<ul style="list-style-type: none"> Degree of compatibility with protection for transit objectives (high/moderate/low) 	<ul style="list-style-type: none"> Moderate. Gradient diff > 5m, difficult construction at RR30 due to CPR & West Duffin Creek 	<ul style="list-style-type: none"> High. Transit higher than Hwy 407 at Hwy 7, raise Hwy 7 an additional 4m
	<ul style="list-style-type: none"> Degree to which existing/future travel demand is satisfied (Overview Study/ traffic modelling) (high/moderate/low) 	<ul style="list-style-type: none"> High. Majority of traffic demand to the north 	<ul style="list-style-type: none"> High. Majority of traffic demand to the north
<i>Geometrics</i>	<ul style="list-style-type: none"> Horizontal alignment (# of radii, curve lengths / route segment length) (qualitative) 	<ul style="list-style-type: none"> Good. 1, (2000m), 1200m/5910m 	<ul style="list-style-type: none"> Fair. 3, (2-2000m, 1-1700m), 3040/5890m
	<ul style="list-style-type: none"> Vertical alignment (length of fill > 5m / cut > 5m, noteworthy max grades) (qualitative) 	<ul style="list-style-type: none"> Fair. 300/1500, fill > 10m for 400m 	<ul style="list-style-type: none"> Fair. 400/1050m, fill > 10m for 400m

FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
		C1 + C11 North of Green River	S4 + S4/SC1 + SC1 + SC6 South of Green River
<i>Geotechnical</i>	<ul style="list-style-type: none"> Potential engineering/environmental problems due to geotechnical conditions (qualitative) 	<ul style="list-style-type: none"> Poor foundation conditions at Little Rouge and West Duffin Creek; soft shallow subgrade for 200 m; erosion susceptible soils 	<ul style="list-style-type: none"> Poor foundation conditions at Little Rouge and West Duffin Creek; erosion susceptible soils
	<ul style="list-style-type: none"> Effects on aggregate resources (type/ha) 	<ul style="list-style-type: none"> No impacts identified 	<ul style="list-style-type: none"> No impacts identified
<i>Staging Options</i>	<ul style="list-style-type: none"> East of construction staging (high/moderate/low) 	<ul style="list-style-type: none"> High. No impacts identified 	<ul style="list-style-type: none"> High. No impacts identified
<i>Construction Considerations</i>	<ul style="list-style-type: none"> Impacts during construction (road/access closures, detours, utilities/rail conflicts) (qualitative) 	<ul style="list-style-type: none"> RR30 interchange bounded by CPR and West Duffins Creek 	<ul style="list-style-type: none"> None
<i>Cost</i>	<ul style="list-style-type: none"> Length (m) 	<ul style="list-style-type: none"> 5910 m 	<ul style="list-style-type: none"> 5890 m
	<ul style="list-style-type: none"> Construction cost (earthworks, roadworks, structures) (1990 dollars) 	<ul style="list-style-type: none"> \$118.6 M 	<ul style="list-style-type: none"> \$99.6 M
	<ul style="list-style-type: none"> Relocation cost (1990 dollars) 	<ul style="list-style-type: none"> \$0 M 	<ul style="list-style-type: none"> \$0 M
	<ul style="list-style-type: none"> Public property affected (number) 	<ul style="list-style-type: none"> 23 properties 	<ul style="list-style-type: none"> 28 properties
	<ul style="list-style-type: none"> Private property affected (number) 	<ul style="list-style-type: none"> 1 property 	<ul style="list-style-type: none"> 1 property
	<ul style="list-style-type: none"> Property cost (1990 dollars for forecast land use) 	<ul style="list-style-type: none"> \$8.9 M 	<ul style="list-style-type: none"> \$9.3 M
	<ul style="list-style-type: none"> Construction, utilities and property cost (1990 dollars) 	<ul style="list-style-type: none"> \$127.5 M 	<ul style="list-style-type: none"> \$113.4 M

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**APPENDIX 10
COMPARISON TABLE OF
POTENTIAL IMPACTS STAGE 2**

FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
		S2 + S4 + S4/SC1 North of Locust Hill	S3 + S3/SC1 South of Locust Hill
NATURAL ENVIRONMENT <i>Ecosystem Integrity</i>	● Severance of/encroachment on identified upland ecosystems (ha)	● Severance of significant remnant woodland in Lots 9-10 Con 9 Markham	● Encroachment on significant remnant woodland in Lots 9-10 Con 9 Markham
	● Severance of/encroachment on identified aquatic ecosystems (ha)	● Crosses Little Rouge Creek north of Locust Hill; West Duffin Creek south of Green River	● Crosses Little Rouge Creek south of Locust Hill; West Duffin Creek south of Green River
	● Severance of/encroachment on identified wetland ecosystems (ha)	● No impacts identified	● No impacts identified
<i>Surface Water Quality and Quantity</i>	● Watercourse crossings (number)	● 6, 2 permanent, 4 intermittent	● 6, 2 permanent, 4 intermittent
	● Encroachment on headwater areas (ha)	● 60 ha	● 60 ha
	● Realignment/channelization required (m)	● 400 m	● 480 m
	● Effects on surface drainage/flood plain (qualitative)	● Channelization of 9 small water courses at 10th Line/Hwy 7	● No impacts identified
	● Nature/extent of management programs (MOEE, Conservation Authorities) (qualitative)	● MTRC Rouge River and West Duffin Creek Watershed/Basin Management Strategies	● MTRC Rouge River and West Duffin Creek Watershed/Basin Management Strategies

APPENDIX 10

Highway 407/Transitway
Markham Road Easterly to East of Brock Road
Environmental Assessment Study

SUMMARY COMPARATIVE ANALYSIS OF STAGE 2 ROUTE SEGMENTS

FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
<i>Fisheries (Aquatic Biology - to be identified in terms of stream crossing number)</i>	<ul style="list-style-type: none"> • Warmwater fisheries (number) • Coldwater fisheries (number) • Extent of riparian vegetation removal (m) • Altered/displaced habitat/spawning areas (m) 	<p>S2 + S4 + S4/SC1 North of Locust Hill</p> <ul style="list-style-type: none"> • 0 • 2, Little Rouge Ck (#7), West Duffin Ck (#13) • 520 m. Mature vegetation displaced on Little Rouge Creek, West Duffin Creek • 640 m, Little Rouge and Duffin Creeks to be spanned, potential spawning area 	<p>S3 + S3/SC1 South of Locust Hill</p> <ul style="list-style-type: none"> • 0 • 2, Little Rouge Ck (#8), West Duffin Ck (#13) • 200 m. Dense mature mixed forest • 640 m, potential to affect moderate cold water habitat and spawning area
<i>Fisheries (Aquatic Biology) cont'd</i>	<ul style="list-style-type: none"> • Effects on recreational, rare/endangered/threatened species (number/qualitative) • Migratory runs affected (number) • Nature/extent of habitat rehabilitation programs (MNR, Conservation Authorities) (qualitative) • Identified upwelling and seepage areas (number/qualitative) 	<p>S2 + S4 + S4/SC1 North of Locust Hill</p> <ul style="list-style-type: none"> • 3 Regionally/Provincially race (Stone Roller, Hornyhead Chub, Stonecat), 1 Nationally Threatened (Redside Dace), 2 Recreational (Brook, Brown Trout) • 1 salmonid Run (#7) • MTRC Riparian Protection and Enhancement Plan and MTRC Little Rouge River/Duffin Creek Basin Management Strategy • 1 High 	<p>S3 + S3/SC1 South of Locust Hill</p> <ul style="list-style-type: none"> • 3 Regionally/Provincially race (Stone Roller, Hornyhead Chub, Stonecat), 1 Nationally Threatened (Redside Dace), 2 Recreational (Brook, Brown Trout) • 1 salmonid Run (#8) • MTRC Riparian Protection and Enhancement Plan and MTRC Little Rouge River/Duffin Creek Basin Management Strategy • 1 High

FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
<i>Wildlife</i>	<ul style="list-style-type: none"> Effects on wildlife species (qualitative) Effects on rare/endangered wildlife species (number/qualitative) Displaced wildlife habitat (ha displaced/total ha (if applicable)) Barrier effects on travel corridors (qualitative) 	S2 + S4 + S4/SC1 North of Locust Hill	S3 + S3/SC1 South of Locust Hill
		<ul style="list-style-type: none"> Major disruption of greenland corridors along Little Rouge and West Duffin, involving highly diverse successional forest. No impacts identified Units 79 (2.8 ha), 80 (1 ha/2), 81 (0.5 ha/7), 82 (0.5 ha/0.5), 83 (0.2 ha/1.8), 84 (7.8 ha) 87 (3.8 ha): 16.6 ha. Major. Wide area of severance in valuable corridors along Little Rouge and West Duffin for deer and furbearers (beaver, mink, muskrat). 	<ul style="list-style-type: none"> Major disruption of greenland corridors along Little Rouge and West Duffin, involving highly diverse successional forest. No impacts identified Units 79 (4 ha), 85 (1 ha/2), 86 (7.3), 87 (0.5 ha): 12.8 ha. Major. Wide area of severance in valuable corridors along Little Rouge and West Duffin for deer and furbearers (beaver, mink, muskrat).
		<ul style="list-style-type: none"> 92.8 ha, 31 ha, 0 ha 7 wells, 1 shallow, 3 drilled, 3 deep bored No impacts identified 	<ul style="list-style-type: none"> 61.56 ha, 16.6 ha, 0 ha 4 wells, 1 shallow, 2 drilled, 1 deep bored No impacts identified
		<ul style="list-style-type: none"> Effect on groundwater resource areas (high water table, recharge areas, significant overburden aquifers) (ha) Private/municipal shallow/deep wells within 150 m of ROW (number) Encroachment on abandoned/existing waste sites (number) 	
<i>Hydrogeology</i>			
<i>Waste Management</i>			

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Highway 407/Transitway
Markham Road Easterly to East of Brock Road
Environmental Assessment Study

SUMMARY COMPARATIVE ANALYSIS OF STAGE 2 ROUTE SEGMENTS

FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
		S2 + S4 + S4/SC1 North of Locust Hill	S3 + S3/SC1 South of Locust Hill
<i>Vegetation (Terrestrial Biology - to be identified in terms of Vegetation Units)</i>	<ul style="list-style-type: none"> Degree of access to/encroachment on/severance of identified Environmentally Significant Areas (ESA's) and/or Areas of Natural and Scientific Interest (Life and Earth Science ANSI's) (ha) 	<ul style="list-style-type: none"> No impacts identified 	<ul style="list-style-type: none"> No impacts identified
	<ul style="list-style-type: none"> Effects on unique or rare herbaceous species or communities (type) 	<ul style="list-style-type: none"> No impacts identified 	<ul style="list-style-type: none"> No impacts identified
	<ul style="list-style-type: none"> Degree of encroachment on/severance of woodlots/forest areas (ha displaced/total ha (if applicable)) 	<ul style="list-style-type: none"> High percentage removals from Units 79 (1.5 ha), 80 (1 ha/2), 81 (0.5 ha/7), 83 (1.4 ha/1.8), 84 (7.8), 87 (3.8): 16 ha including mature sugar maple woodlot, mixed deciduous woods, wooded wetland, streamside cedar woods, and white pine plantation 	<ul style="list-style-type: none"> High percentage removals from Units 79 (3 ha), 81/82 (1.44 ha/7.5), 85 (1 ha/2), 86 (7.3 ha), 87 (0.5 ha): 13.2 ha containing spruce and larch plantation, mature sugar maple woodlot, streamside cedar, white pine, and upland hardwood species
	<ul style="list-style-type: none"> Nature/extent of forest management/research programs (WIA, plantation, ASA, research plots) (qualitative) 	<ul style="list-style-type: none"> Minor. Units 84: Plantings of white spruce along Little Rouge, and some walkways mowed by owner; 2 ha white pine plantation in Unit 80 	<ul style="list-style-type: none"> Minor. Unit 85: 2 ha conifer plantation with white spruce and larch

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SUMMARY COMPARATIVE ANALYSIS OF STAGE 2 ROUTE SEGMENTS

FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
		S2 + S4 + S4/SC1 North of Locust Hill	S3 + S3/SC1 South of Locust Hill
SOCIAL ENVIRONMENT <i>Communities</i>	<ul style="list-style-type: none"> • Encroachment on/severance of established and proposed settlement areas (qualitative) • Influence in defining settlement areas (qualitative) 	<ul style="list-style-type: none"> • No impacts identified 	<ul style="list-style-type: none"> • No impacts identified
	<ul style="list-style-type: none"> • Residences displaced (number) 	<ul style="list-style-type: none"> • Highly influential in reinforcing north limit of Locust Hill and south limits of Green River, buffers Green River from Seaton and Locust Hill from East Markham, also defines north Seaton 	<ul style="list-style-type: none"> • Highly influential in reinforcing south limits of Locust Hill and Green River, buffers Green River from Seaton, also defines north Seaton
	<ul style="list-style-type: none"> • Access to/displacement of community facilities (major institutional uses) (qualitative) 	<ul style="list-style-type: none"> • 11, 5 residences, 6 ORC lands 	<ul style="list-style-type: none"> • 4 residences
	<ul style="list-style-type: none"> • Delivery of community services (emergency, school bus) (qualitative) 	<ul style="list-style-type: none"> • Moderate impacts, improved access to Toronto Catholic Cemetery Association future cemetery lands 	<ul style="list-style-type: none"> • Moderate impacts, improved access to Toronto Catholic Cemetery Association future cemetery lands
	<ul style="list-style-type: none"> • Inter-urban and rural-urban barrier effects (qualitative) 	<ul style="list-style-type: none"> • Low. 3 bus routes disrupted 	<ul style="list-style-type: none"> • Low. 7 bus routes disrupted
	<ul style="list-style-type: none"> • Access to/displacement of recreational uses (qualitative) 	<ul style="list-style-type: none"> • No impacts identified 	<ul style="list-style-type: none"> • No impacts identified
<i>Recreation</i>		<ul style="list-style-type: none"> • High potential to displace Seaton Hiking Trail and Seaton Flying Club at West Duffin Valley 	<ul style="list-style-type: none"> • High potential to displace Seaton Hiking Trail and Seaton Flying Club at West Duffin Valley

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FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
ECONOMIC ENVIRONMENT <i>Provincial/Municipal/Private Land Use Development Strategies</i>	<ul style="list-style-type: none"> Degree of compatibility with municipal development goals/objectives (high/moderate/low) Capability to provide transportation service/stimulate development of major development initiatives (Seaton, Pickering Airport) (high/moderate/low) Compatibility with Provincial/Federal planning goals/objectives/policies (high/moderate/low) Constraints/opportunities for designated settlement area expansion (qualitative) Population/employment redistribution effects (qualitative) 	S2 + S4 + S4/SC1 North of Locust Hill	S3 + S3/SC1 South of Locust Hill
		<ul style="list-style-type: none"> Moderate, may impose constraint on community facility uses in the Central District of East Markham Project, may create pressure for unplanned growth of Locust Hill and Green River. Not compatible with Durham OP and Pickering's land use objectives Favourable to both Seaton and federal Pickering Lands, good service provided to East Markham Project Moderate, some conflict with community facility uses in southeast corner of East Markham Project, minimizes impact to linear greenland corridors and agricultural land Moderate, buffers Green River from Seaton and Locust Hill from East Markham; both hamlets have convenient freeway access from I/Cs at York Rd 30 and Ninth Line No significant influence. Reinforces hamlet, Seaton designations 	<ul style="list-style-type: none"> Moderate, may impose constraint on East Markham project, may fuel growth of Locust Hill & Green River, not compatible with Durham OP and Pickering's land use objectives Favourable to both Seaton and federal Pickering Lands, good service provided to East Markham Project Minimizes impacts to linear greenland corridors and agricultural land Moderate, opportunity for economic connection between Locust Hill and East Markham, Green River buffered from Seaton, both existing hamlets have convenient freeway access from I/Cs at York Rd 30 and Ninth Line No significant influence. Reinforces hamlet, Seaton designations

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FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
		S2 + S4 + S4/SC1 North of Locust Hill	S3 + S3/SC1 South of Locust Hill
<i>Visual Aesthetics</i> (View from the facility)	<ul style="list-style-type: none"> Total aesthetic value of visibly accessible landscape components (qualitative/scenic value) Total scenic value based on composition, arrangement and sequence of landscape components (qualitative/scenic value) Total potential visual impact on sensitive viewer groups based on sensitivity, proximity and frequency of viewer groups (qualitative/scenic value) 	<ul style="list-style-type: none"> Open fields with vegetation, vegetation associated with Little Rouge Creek Valley (+2) Gently rolling views with skyline of city (+2) Scattered dwellings in area close to Locust Hill (-2) 	<ul style="list-style-type: none"> Aesthetic vegetation in Little Rouge, West Duffin Creek & south of Green River, -1 CP Rail crossing; overall (+2) Flat landscape to slightly rolling Proximity to Locust Hill community and edge of Green River (-2)
	<i>Noise</i>	<ul style="list-style-type: none"> 7 residences impacted, 2 (1 db), 1 (5-10 db), 4 (10-15 db) 4 residences impacted, 3 (60-65 db), 1 (65-70 db) 	<ul style="list-style-type: none"> 3 residences impacted, 3 (5-10 db) 2 residences impacted, 1 (60-65 db), 1 (65-70 db)

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SUMMARY COMPARATIVE ANALYSIS OF STAGE 2 ROUTE SEGMENTS

FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
		S2 + S4 + S4/SC1 North of Locust Hill	S3 + S3/SC1 South of Locust Hill
<i>Non-Farm Commercial Activities</i>	• Businesses displaced (number)	• 2, One is a relatively significant local employer	• No impacts identified
	• Employees displaced (number)	• 13	• No impacts identified
	• Changes (+/-) in business exposure (qualitative)	• Moderate, reduction in regional traffic for businesses on Hwy 7 in Locust Hill and Green River, increase on York Rd 30	• Moderate, reduction in regional traffic for businesses on Hwy 7 in Locust Hill and Green River, increase on York Rd 30
	• Changes in site access/internal circulation (qualitative)	• 2 businesses have loss of property	• No impacts identified
AGRICULTURE <i>Physical Resource Consumption</i>	• Loss of Class 1 and Class 2 land (ha)	• 117.4 ha, 75-95% Class 1 with no limitations; some Class 2 with topographic limitations at West Duffin Creek	• 134.02 ha, 70-80% Class 1 with no limitations; some Class 2 with topographic limitations at West Duffin Creek
	• Loss of Class 3 and Class 4 land (ha)	• 3.2 ha, < 10% of total link area, excessive moisture limitation	• 3.2 ha, < 10% of total link area, excessive moisture limitation
	• Total farm property required (ha)	• 56.05 ha	• 92.46 ha

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SUMMARY COMPARATIVE ANALYSIS OF STAGE 2 ROUTE SEGMENTS

FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
		S2 + S4 + S4/SC1 North of Locust Hill	S3 + S3/SC1 South of Locust Hill
<i>Facility Resource Consumption</i>	<ul style="list-style-type: none"> Farm buildings/structures displaced (number/quality) Specialty crop (rootstocks) displaced (type/ ha) Total owned land required (ha) Improved land required (ha) 	<ul style="list-style-type: none"> 10, 2 houses, 4 barns, 1 horse track, 3 silos. No impacts identified 0.98 ha. Predominantly ORC land No impacts identified 	<ul style="list-style-type: none"> 7, 3 houses, 4 other structures (poor condition) No impacts identified No impacts identified. ORC land No impacts identified
	<ul style="list-style-type: none"> Total farm properties directly affected (number) Livestock operations (field/facility) affected (number/type) Specialty operations affected (number/type) Farm properties > 20 ha affected (number) Severed parcels > 20 ha (number) Severed parcels < 20 ha (number) Intra-property movement patterns affected (number) 	<ul style="list-style-type: none"> 5, 4 cash crop, 1 horse. 1 horse No impacts identified 5 properties 3 parcels, (30 ha, 285 ha, 23.5 ha) 6 parcels 6, 2 severances landlocked 	<ul style="list-style-type: none"> 5, 4 cash crop, 1 horse. All ORC owned. Includes effects of relocated Highway 7. 1 horse No impacts identified 5 properties 2 parcels 7 parcels 5, 3 severances landlocked

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SUMMARY COMPARATIVE ANALYSIS OF STAGE 2 ROUTE SEGMENTS

FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
		S2 + S4 + S4/SC1 North of Locust Hill	S3 + S3/SC1 South of Locust Hill
<i>Area Operation Impacts</i>	<ul style="list-style-type: none"> Transportation routes affected (number) Division of agricultural community areas (number) 	<ul style="list-style-type: none"> 2, Hwy 7, 10th Line Some separation of agricultural hinterland from Hamlet of Locust Hill 	<ul style="list-style-type: none"> 4, Hwy 7, York Road 30, 10th & 11th Lines Some separation of agricultural hinterland from Hamlet of Locust Hill
CULTURAL ENVIRONMENT <i>Historical Resources</i>	<ul style="list-style-type: none"> Features within 100 m of ROW (exceptional/moderate/ordinary) Features within ROW (exceptional/moderate/ordinary) 	<ul style="list-style-type: none"> 2, 1 moderate residence, 1 moderate marker 3, 2 ordinary residences, 1 moderate residence 	<ul style="list-style-type: none"> 1, 1 ordinary residence 2, 2 ordinary residences
<i>Cultural Landscape</i>	<ul style="list-style-type: none"> Degree of disruption to landscape units (major/moderate/minor) 	<ul style="list-style-type: none"> High to moderate, rural lands with heritage sites and historical settlements (Green River, Whitevale, Locust Hill), open agricultural land 	<ul style="list-style-type: none"> High to moderate, heritage sites/historical settlements of Green River, Whitevale, and Locust Hill, open agricultural lands
<i>Archaeological Resources</i>	<ul style="list-style-type: none"> Registered sites within ROW (number/type) Potentially significant sites/resource areas affected (number/type) 	<ul style="list-style-type: none"> 1 site, Brown Site (AIGt-59, isolated findspot). Not considered significant 1 site, Burkholder Site (AIGt-19), Woodland camp site), significant. Encroaches on historically recorded pine stand 	<ul style="list-style-type: none"> 1 site, Ansell Site (AIGt-29, Archaic camp site). Significant Encroaches on historically recorded pine stand

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FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
		S2 + S4 + S4/SC1 North of Locust Hill	S3 + S3/SC1 South of Locust Hill
TRANSPORTATION AND ENGINEERING <i>Network Configuration and Traffic Service</i>	<ul style="list-style-type: none"> Interchange conditions (qualitative) 	<ul style="list-style-type: none"> Fair. All standard interchanges except a non-standard design interchange at MBP 	<ul style="list-style-type: none"> Fair. All standard interchanges except a 55° skew interchange with RR30
	<ul style="list-style-type: none"> Degree of compatibility with provincial road system (existing/proposed) (high/moderate/low) 	<ul style="list-style-type: none"> High 	<ul style="list-style-type: none"> Low. Hwy 7 realignment at RR30
	<ul style="list-style-type: none"> Degree of compatibility with municipal road system (existing/proposed) (high/moderate/low) 	<ul style="list-style-type: none"> Moderate. Sideline 34 closed, 10th Line denied access to Hwy 407 	<ul style="list-style-type: none"> Moderate. 11 Con Rd & SL 34 closed
	<ul style="list-style-type: none"> Degree of compatibility with protection for transit objectives (high/moderate/low) 	<ul style="list-style-type: none"> Moderate. Transit 4m fill in valley 	<ul style="list-style-type: none"> High. No impacts identified
	<ul style="list-style-type: none"> Degree to which existing/future travel demand is satisfied (Overview Study/traffic modelling) (high/moderate/low) 	<ul style="list-style-type: none"> High. Majority of traffic demand to the north and south of Hwy 407 	<ul style="list-style-type: none"> High. Majority of traffic demand to the north

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SUMMARY COMPARATIVE ANALYSIS OF STAGE 2 ROUTE SEGMENTS

FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
		S2 + S4 + S4/SC1 North of Locust Hill	S3 + S3/SC1 South of Locust Hill
<i>Geometrics</i>	<ul style="list-style-type: none"> Horizontal alignment (# of radii, curve lengths / route segment length) (qualitative) Vertical alignment (length of fill > 5m / cut > 5m, noteworthy max grades) (qualitative) 	<ul style="list-style-type: none"> Fair. 3, (2-2000, 1-3000), 3420/5520m Fair/poor. 1700m/1050m, RR30 raised 6m, Fill > 10m through West Duffin Creek 	<ul style="list-style-type: none"> Good. 1, (2000m), 900/5610 Fair. 650/1600, Fill > 10m for 100m
<i>Geotechnical</i>	<ul style="list-style-type: none"> Potential engineering/environmental problems due to geotechnical conditions (qualitative) Effects on aggregate resources (type/ha) 	<ul style="list-style-type: none"> Poor foundation conditions at Little Rouge and West Duffin Creek No impacts identified 	<ul style="list-style-type: none"> Poor foundation conditions at Little Rouge and West Duffin Creek No impacts identified
<i>Staging Options</i>	<ul style="list-style-type: none"> East of construction staging (high/moderate/low) 	<ul style="list-style-type: none"> High. No impacts. Opportunity to connect Hwy 7 	<ul style="list-style-type: none"> High. No impacts identified
<i>Construction Considerations</i>	<ul style="list-style-type: none"> Major impacts during construction (road/access closures, detours, utilities/rail conflicts) (qualitative) 	<ul style="list-style-type: none"> Detour required for MBP, 10th Line and Hwy 7 	<ul style="list-style-type: none"> None

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SUMMARY COMPARATIVE ANALYSIS OF STAGE 2 ROUTE SEGMENTS

FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
		S2 + S4 + S4/SC1 North of Locust Hill	S3 + S3/SC1 South of Locust Hill
Cost	Length (m)	<ul style="list-style-type: none"> 5600 m 	<ul style="list-style-type: none"> 5680 m
	Construction cost (earthworks, roadworks, structures) (1990 dollars)	<ul style="list-style-type: none"> \$105.6 M, higher due to detours 	<ul style="list-style-type: none"> \$99.4 M
	Relocation cost (1990 dollars)	<ul style="list-style-type: none"> \$0 M 	<ul style="list-style-type: none"> \$1.8 M, relocate 1.5 km of Hwy 7
	Public property affected (number)	<ul style="list-style-type: none"> 23 properties 	<ul style="list-style-type: none"> 24 properties
	Private property affected (number)	<ul style="list-style-type: none"> 11 properties 	<ul style="list-style-type: none"> 4 properties
	Property cost (1990 dollars for forecast land use)	<ul style="list-style-type: none"> \$10.3 M 	<ul style="list-style-type: none"> \$10.0 M
	Construction, utilities and property cost (1990 dollars)	<ul style="list-style-type: none"> \$116.1 M 	<ul style="list-style-type: none"> \$111.2 M

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SUMMARY COMPARATIVE ANALYSIS OF
STAGE 2 ROUTE SEGMENTS

**APPENDIX 11
COMPARISON TABLE OF
POTENTIAL IMPACTS STAGE 3**

FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
		SC7 North of Brougham	S6 + SC3 South of Brougham
NATURAL ENVIRONMENT <i>Ecosystem Integrity</i>	<ul style="list-style-type: none"> Severance of/encroachment on identified upland ecosystems (ha) Severance of/encroachment on identified aquatic ecosystems (ha) Severance of/encroachment on identified wetland ecosystems (ha) 	<ul style="list-style-type: none"> No impacts identified No impacts identified No impacts identified 	<ul style="list-style-type: none"> No impacts identified Nominal encroachment on coldwater tributaries to Duffin Creek southeast of Brougham No impacts identified
	<ul style="list-style-type: none"> Watercourse crossings (number) Encroachment on headwater areas (ha) Realignment/channelization required (m) Effects on surface drainage/flood plain (qualitative) Nature/extent of management programs (MOEE, Conservation Authorities) (qualitative) 	<ul style="list-style-type: none"> 6, 5 intermittent streams 1 permanent watercourse 20 ha 650 m Significant, re-grade wetland for I/C at Sideline 24, fill in gravel pit & pond MTRC Duffin Creek Basin Management Strategy 	<ul style="list-style-type: none"> 7, 5 intermittent streams, 2 permanent watercourse 110 ha 800 m Significant, re-grade wetland for I/C at Sideline 24, fill in gravel pit & pond MTRC Duffin Creek Basin Management Strategy
	Surface Water Quality and Quantity		

FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
		SC7 North of Brougham	S6 + SC3 South of Brougham
<i>Fisheries (Aquatic Biology - to be identified in terms of stream crossing number)</i>	<ul style="list-style-type: none"> Warmwater fisheries (number) Coldwater fisheries (number) Extent of riparian vegetation removal (m) Altered/displaced habitat, spawning areas (m) 	<ul style="list-style-type: none"> No impacts identified 1, Lot 14 (#43) 50 m 650 m, low to moderate coldwater fish habitat, no major spawning area 	<ul style="list-style-type: none"> No impacts identified 2, Lot 16 (#37), Lot 14 (#43) 355 m 691 m, moderate cold habitat (Urfe Creek), may alter spawning area
<i>Fisheries (Aquatic Biology) contd</i>	<ul style="list-style-type: none"> Effects on recreational, rare/endangered/threatened species (number/qualitative) Migratory runs affected (number) Nature/extent of habitat rehabilitation programs (MNR, Conservation Authorities) (qualitative) Identified upwelling and seepage areas (number/qualitative) 	<ul style="list-style-type: none"> 2 recreational species (Brook, Brown Trout) No impacts identified MTRC Riparian Protection and Enhancement Plan, and MTRC Duffin Creek Basin Management Strategy 2, 1 high, 1 moderately high 	<ul style="list-style-type: none"> 2 recreational species (Brook, Brown Trout) No impacts identified MTRC Riparian Protection and Enhancement Plan, and MTRC Duffin Creek Basin Management Strategy 3, 1 high, 2 moderately high

FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
		SC7 North of Brougham	S6 + SC3 South of Brougham
<i>Vegetation (Terrestrial Biology - to be identified in terms of Vegetation Units)</i>	<ul style="list-style-type: none"> Degree of access to/encroachment on/severance of identified Environmentally Significant Areas (ESA's) and/or Areas of Natural and Scientific Interest (Life and Earth Science ANSI's) (ha) 	<ul style="list-style-type: none"> No impacts identified 	<ul style="list-style-type: none"> No impacts identified
	<ul style="list-style-type: none"> Effects on unique or rare herbaceous species or communities (type) 	<ul style="list-style-type: none"> No impacts identified 	<ul style="list-style-type: none"> No impacts identified
	<ul style="list-style-type: none"> Degree of encroachment on/severance of woodlots/forest areas (ha displaced/total ha (if applicable)) 	<ul style="list-style-type: none"> High percentage of removals from Units 55 (2 ha/3), 56 (1 ha/1), 61 (1.6 ha/4): 4.6 ha including woodland with white birch, elm, poplar, hawthorn, and streamside woodland with large sugar maples, red oak, and dense shrubs, man-made pond and wet area 	<ul style="list-style-type: none"> High percentage of removals from Units 54 (1.8 ha/2), 55 (2.0 ha/3), 67 (1.6 ha), 68 (1.0 ha/8), 70 (0.4 ha/0.4): 6.8 ha including lowland willows, poplars, Manitoba maples, man-made pond and wet area, mixed woods with sugar maple, oak, poplar, white pine, cedar, birch and elm
	<ul style="list-style-type: none"> Nature/extent of forest management/research programs (WIA, plantation, ASA, research plots) (qualitative) 	<ul style="list-style-type: none"> No impacts identified 	<ul style="list-style-type: none"> Minor. Unit 56 (0.5 ha): encroachment on a 1 ha pine/spruce plantation

FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
		SC7 North of Brougham	S6 + SC3 South of Brougham
<i>Wildlife</i>	• Effects on wildlife species (qualitative)	• Minimal. Removal of deer and small game habitat adjacent to wetland (Unit 55); some waterfowl habitat removed associated with pond.	• Minimal. Removal of deer and small game habitat adjacent to wetland (Unit 55); some waterfowl habitat removed associated with pond. Loss of 5 ha wetland used by waterfowl and amphibians (Unit 69).
	• Effects on rare/endangered wildlife species (number/qualitative)	• No impacts identified	• No impacts identified
	• Displaced wildlife habitat (ha displaced/total ha (if available))	• Units 55 (2.0/3), 56 (1 ha/1), 61 (1.6 ha/4): 5.6 ha.	• Units 48 (1 ha/1), 54 (1.8 ha/2), 55 (2 ha/3), 56 (1 ha/1), 59 (1 ha/2), 60 (2 ha/13), 67 (1.6 ha), 68 (1.5 ha/8), 69 (3.5 ha/5), 70 (0.4 ha/0.4): 18.50 ha.
	• Barrier effects on travel corridors (qualitative)	• Minimal. Small isolated habitat areas.	• Minimal. Small isolated habitat areas.
<i>Hydrogeology</i>	• Effect on groundwater resource areas (high water table, recharge areas, significant overburden aquifers) (ha)	• 41.14 ha, 14.16 ha, 60.46 ha	• 23 ha, 69 ha, 5 ha
	• Private/municipal shallow/deep wells within 150 m of ROW (number)	• 7 wells, 1 shallow, 2 drilled, 4 deep bored	• 3 wells, 1 shallow, 2 drilled

FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
		SC7 North of Brougham	S6 + SC3 South of Brougham
<i>Waste Management</i>	<ul style="list-style-type: none"> • Encroachment on abandoned/existing waste sites (number) 	<ul style="list-style-type: none"> • No impacts identified 	<ul style="list-style-type: none"> • No impacts identified
SOCIAL ENVIRONMENT <i>Communities</i>	<ul style="list-style-type: none"> • Encroachment on/severance of established and proposed settlement areas (qualitative) 	<ul style="list-style-type: none"> • Link travels through Brougham's residential area along Brock Road 	<ul style="list-style-type: none"> • Cuts through Seaton Lands south of Green River
	<ul style="list-style-type: none"> • Influence in defining settlement areas (qualitative) 	<ul style="list-style-type: none"> • Highly influential in defining northern envelop for Brougham 	<ul style="list-style-type: none"> • Highly influential in defining south limit of Brougham, also defines north Seaton
	<ul style="list-style-type: none"> • Residences displaced (number) 	<ul style="list-style-type: none"> • 18, 3 ORC lands 	<ul style="list-style-type: none"> • 11 ORC lands
	<ul style="list-style-type: none"> • Access to/displacement of community facilities (major institutional uses) (qualitative) 	<ul style="list-style-type: none"> • No impacts identified 	<ul style="list-style-type: none"> • No impacts identified
	<ul style="list-style-type: none"> • Delivery of community services (emergency, school bus) (qualitative) 	<ul style="list-style-type: none"> • Low. 8 routes disrupted 	<ul style="list-style-type: none"> • Low. 18 routes disrupted
<i>Recreation</i>	<ul style="list-style-type: none"> • Inter-urban and rural-urban barrier effects (qualitative) 	<ul style="list-style-type: none"> • No impacts identified 	<ul style="list-style-type: none"> • No impacts identified
	<ul style="list-style-type: none"> • Access to/displacement of recreational uses (qualitative) 	<ul style="list-style-type: none"> • No impacts identified 	<ul style="list-style-type: none"> • No impacts identified

FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
		SC7 North of Brougham	S6 + SC3 South of Brougham
<i>Visual Aesthetics</i> (View from the facility)	<ul style="list-style-type: none"> Total aesthetic value of visibly accessible landscape components (qualitative/scenic value) Total scenic value based on composition, arrangement and sequence of landscape components (qualitative/scenic value) Total potential visual impact on sensitive viewer groups based on sensitivity, proximity and frequency of viewer groups (qualitative/scenic value) 	<ul style="list-style-type: none"> moderately attractive rolling topography (+ 2) some viewing opportunities especially on higher ground (+ 3) high negative impact north of community along Brock Road (-4) 	<ul style="list-style-type: none"> aesthetic vegetation, (+ 4) rolling hills vista of large valley to the east (+ 4) 0, south side of Brougham community and long range views from east (-3)
	<i>View of the facility</i>		
<i>Noise</i>	<ul style="list-style-type: none"> Noise sensitive receivers experiencing changes (+/-) in sound levels (5 dB intervals) over pre-existing conditions (number) Noise sensitive receivers experiencing resultant absolute noise level over 55 db) (number) 	<ul style="list-style-type: none"> 10 residences impacted, 10 (5-10 db) 15 residences impacted, 12 (55-60) db, 3 (60-65 db) 	<ul style="list-style-type: none"> 2 residences impacted, 1 (5-10 db), 1 (15-20 db) 2 residences impacted, 1 (55-60 db), 1 (60-65 db)

FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
		SC7 North of Brougham	S6 + SC3 South of Brougham
ECONOMIC ENVIRONMENT <i>Provincial/Municipal/Private Land Use Development Strategies</i>	<ul style="list-style-type: none"> Degree of compatibility with municipal development goals/objectives (high/moderate/low) 	<ul style="list-style-type: none"> Moderate, only partially compatible with Durham OP but is compatible with Pickering land use objectives for 407 (buffers Brougham from Airport). However, encroaches on north limits of Brougham 	<ul style="list-style-type: none"> Moderate, not fully compatible with Pickering/Durham's land use objectives for 407, but does reinforce south limit of Brougham. Town of Pickering initially preferred route north of Brougham to buffer hamlet from Pickering Airport
	<ul style="list-style-type: none"> Capability to provide transportation service/stimulate development of major development initiatives (Seaton, Pickering Airport) (high/moderate/low) 	<ul style="list-style-type: none"> Moderate, some flexibility to service both federal Pickering Lands and Seaton, less than optimal transit connections at east end of Seaton 	<ul style="list-style-type: none"> Moderate, favours Seaton over federal Pickering Lands; requires dedicated access for airport; lowers stimulus for airport peripheral growth
	<ul style="list-style-type: none"> Compatibility with Provincial/Federal planning goals/objectives/policies (high/moderate/low) 	<ul style="list-style-type: none"> Moderate compatibility with objectives for both federal Pickering Lands and Seaton Community. Minimizes impact to linear greenland corridors and agricultural land 	<ul style="list-style-type: none"> Moderate compatibility with objectives for both federal Pickering Lands and Seaton Community (buffer between Seaton and Brougham). Minimizes impact to linear greenland corridors and agricultural land
	<ul style="list-style-type: none"> Constraints/opportunities for designated settlement area expansion (qualitative) 	<ul style="list-style-type: none"> Buffers Brougham from potential airport-related developments but allows exposure to Seaton 	<ul style="list-style-type: none"> Restricts southerly expansion of Brougham, northerly expansion restricted by Airport
	<ul style="list-style-type: none"> Population/employment redistribution effects (qualitative) 	<ul style="list-style-type: none"> Moderate, potential to attract industrial uses into federal Pickering Lands; encourage residential uses in northeast Seaton; allows for potential integration of services of Brougham 	<ul style="list-style-type: none"> Potential to discourage population redistribution in north Seaton due to proximity effects, but no significant divergence from Region of Durham strategy

FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
		SC7 North of Brougham	S6 + SC3 South of Brougham
<i>Non-Farm Commercial Activities</i>	<ul style="list-style-type: none"> Businesses displaced (number) Employees displaced (number) Changes (+/-) in business exposure (qualitative) Changes in site access/internal circulation (qualitative) 	<ul style="list-style-type: none"> 1 business, Tri Temp (Lot 14 Con 6) 5, Tri Temp Moderate, reduction in regional traffic for businesses on Hwy 7, increased exposure for north Brougham along Brock Rd No impacts identified 	<ul style="list-style-type: none"> 1 business, Tri Temp (Lot 14 Con 6) 5, Tri Temp Moderate, reduction in regional traffic for businesses on Hwy 7, increased exposure for south Brougham along Brock Rd No impacts identified
AGRICULTURE <i>Physical Resource Consumption</i>	<ul style="list-style-type: none"> Loss of Class 1 and Class 2 land (ha) Loss of Class 3 and Class 4 land (ha) Total farm property required (ha) 	<ul style="list-style-type: none"> 133.1 ha, > 40% Class 1, no limitations No impacts identified 0 ha 	<ul style="list-style-type: none"> 130.2 ha, > 50% Class 1, no limitations No impacts identified No impacts identified
<i>Facility Resource Consumption</i>	<ul style="list-style-type: none"> Farm buildings/structures displaced (number/quality) Specialty crop (rootstocks) displaced (type/ ha) Total owned land required (ha) Improved land required (ha) 	<ul style="list-style-type: none"> 6, 1 house, 5 barns/sheds (poor condition) nursery-tree stock, 4.8 ha Dutchmaster Nursery Lot 16 Con 6 6.4 ha No impacts identified 	<ul style="list-style-type: none"> 9, 2 houses, 7 barns/sheds (fair condition) nursery-tree stock, 3.0 ha Dutchmaster Nursery Lot 16 Con 6 14.3 ha. Affects more private property (east of Seaton/Airport lands) No impacts identified

FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
		SC7 North of Brougham	S6 + SC3 South of Brougham
<i>Farm Operation Impacts</i>	● Total farm properties directly affected (number)	● 4, 1 nursery, 1 beef, 2 cash crops. 2 are on publicly owned land	● 4, 1 dairy, 1 nursery, 1 beef, 1 cash crop. 3 are on publicly owned land
	● Livestock operations (field/facility) affected (number/type)	● 1 beef	● 1 dairy
	● Specialty operations affected (number/type)	● 1, Severs, requires 15% (6.4 ha) of parcel. Major adverse impacts, could jeopardize continuance of operation	● 1 - Impact limited to encroachment on southeast corner. Requires 9% (4 ha) of parcel.
	● Farm properties > 20 ha affected (number)	● 3 properties	● 3 properties
	● Severed parcels > 20 ha (number)	● 1 parcel	● 3 parcels
	● Severed parcels < 20 ha (number)	● 4 parcels	● 2 parcels
<i>Area Operation Impacts</i>	● Intra-property movement patterns affected (number)	● 3	● 3
	● Transportation routes affected (number)	● 7 roads, Hwy 7, Sidelines 24, 22, 20, 16, 14, and Brock Road	● 7 roads, Hwy 7, Sidelines 26, 24, 22, 16, 14, and Brock Road. Possible temporary disruption due to realignment of Sideline 16
	● Division of agricultural community areas (number)	● Some separation of agricultural hinterland from Brougham service centre	● Some separation of agricultural hinterland from Brougham service centre

FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
		SC7 North of Brougham	S6 + SC3 South of Brougham
CULTURAL ENVIRONMENT <i>Historical Resources</i>	<ul style="list-style-type: none"> Features within 100 m of ROW (exceptional/moderate/ordinary) Features within ROW (exceptional/moderate/ordinary) 	<ul style="list-style-type: none"> 1, 1 ordinary residence 4, 4 ordinary residences with "group value" in Brougham 	<ul style="list-style-type: none"> No impacts identified 5, 2 moderate residences, 1 moderate farm, 1 ordinary farm, 1 moderate cemetery
	<i>Cultural Landscape</i>	<ul style="list-style-type: none"> Moderate, encroachment on heritage/historical settlements (Brougham), Hwy 7 corridor, and agricultural landscape 	<ul style="list-style-type: none"> Moderate, cuts across Hwy 7 corridor and part of Duffin Creek Valley wall (10 m cut)
<i>Archaeological Resources</i>	<ul style="list-style-type: none"> Registered sites within ROW (number/type) 	<ul style="list-style-type: none"> 1 site, Peter Webb Site II (AIGs-73, 1.2 ha Iroquoian Village). Significant 	<ul style="list-style-type: none"> 1 site, Salgo Site (AIGs-27, Archaic campsite). Significant
	<ul style="list-style-type: none"> Potentially significant sites/resource areas affected (number/type) 	<ul style="list-style-type: none"> 1 site, Peter Webb Site I (AIGs-78, Iroquoian Village). Significant. Encroaches on historically recorded pine stand 	<ul style="list-style-type: none"> Encroaches on historically recorded pine stand

FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
		SC7 North of Brougham	S6 + SC3 South of Brougham
TRANSPORTATION AND ENGINEERING <i>Network Configuration and Traffic Service</i>	<ul style="list-style-type: none"> Interchange conditions (qualitative) Degree of compatibility with provincial road system (existing/proposed) (high/moderate/low) Degree of compatibility with municipal road system (existing/proposed) (high/moderate/low) Degree of compatibility with protection for transit objectives (high/moderate/low) Degree to which existing/future travel demand is satisfied (Overview Study/traffic modelling) (high/moderate/low) 	<ul style="list-style-type: none"> Good. Non-Standard 70° skew I/C at SL14 High High. Close, SL's 22 and 20, SL 24-local road High. Transit higher than Hwy at SL 14 & 16 Moderate. SL24-61% of traffic through residential area 	<ul style="list-style-type: none"> Good. Non-Standard, 55° skew I/C at SL14 High Moderate. Close ROW for SL's 20 & 22, SL 24-local road Moderate. High cost, grading differential > 5m at Brock Road Moderate. SL24-58% of traffic through residential area
	<ul style="list-style-type: none"> Horizontal alignment (# of radii, curve lengths / route segment length) (qualitative) Vertical alignment (length of fill > 5m / cut > 5 m, noteworthy max grades) (qualitative) 	<ul style="list-style-type: none"> Fair. 3, (2-2000m, 1-5250m), 3690m/5140m Fair. 0m/0m, Hwy at grade at two watercourses - long length (2.8 km) of steep grade (2.2%) 	<ul style="list-style-type: none"> Fair/good. 2, (2-1500m), 2300/5290 Fair/Good. 1100/1150, Cut > 10m for 350m - maximum grades less than 1.1%
<i>Geometrics</i>			

FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
		SC7 North of Brougham	S6 + SC3 South of Brougham
<i>Geotechnical</i>	<ul style="list-style-type: none"> Potential engineering/environmental problems due to geotechnical conditions (qualitative) Effects on aggregate resources (type/ha) 	<ul style="list-style-type: none"> No impacts identified No impacts identified 	<ul style="list-style-type: none"> Problems, 300m of shallow soft subgrade No impacts identified
	<i>Staging Options</i>	<ul style="list-style-type: none"> Moderate. Major disadvantage, directs majority of traffic through Brougham 	<ul style="list-style-type: none"> High. No problems, avoids directing majority of traffic through Brougham
<i>Construction Considerations</i>	<ul style="list-style-type: none"> Major impacts during construction (road/access closures, detours, utilities/rail conflicts) (qualitative) 	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> None
	<i>Cost</i>	<ul style="list-style-type: none"> 5140 m \$82.4 M \$0 M 35 properties 0 properties \$11.9 M \$94.3 M 	<ul style="list-style-type: none"> 5290 m \$84.1 M \$0 M 25 properties 6 properties \$7.7 M \$91.8 M

APPENDIX 12
COMPARISON TABLE OF
POTENTIAL IMPACTS STAGE 4

FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
		S2 + C1 + C9 North of Locust Hill / Green River	S3 + S3/SC1 + SC1 + SC5 South of Locust Hill / Green River
NATURAL ENVIRONMENT <i>Ecosystem Integrity</i>	<ul style="list-style-type: none"> Severance of/encroachment on identified upland ecosystems (ha) Severance of/encroachment on identified aquatic ecosystems (ha) Severance of/encroachment on identified wetland ecosystems (ha) 	<ul style="list-style-type: none"> Severance of significant remnant woodlot in Lots 9-10 Con 9 Markham Crosses Little Rouge Creek north of Locust Hill; West Duffins Creek south of Green River No impacts identified 	<ul style="list-style-type: none"> Encroachment on significant remnant woodlot in Lots 9-10 Con 9 Markham Crosses Little Rouge Creek north of Locust Hill; West Duffins Creek south of Green River No impacts identified
	<ul style="list-style-type: none"> Watercourse crossings (number) Encroachment on headwater areas (ha) Realignment/channelization required (m) Effects on surface drainage/flood plain (qualitative) 	<ul style="list-style-type: none"> 6, 3 permanent, 3 intermittent 60 ha 400 m Significant, 2 water courses meander through interchange at RR30, Hwy grade opposite OG slope for 200m at drainage divide between Little Rouge and West Duffins Creek 	<ul style="list-style-type: none"> 6, 2 permanent, 4 intermittent 60 ha 480 m No impacts identified
	<ul style="list-style-type: none"> Nature/extent of management programs (MOEE, Conservation Authorities) (qualitative) 	<ul style="list-style-type: none"> MTRC Rouge River and West Duffins Creek Watershed/Basin Management Strategies 	<ul style="list-style-type: none"> MTRC Rouge River and West Duffins Creek Watershed/Basin Management Strategies
Surface Water Quality and Quantity			

FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
		S2 + C1 + C9 North of Locust Hill / Green River	S3 + S3/SC1 + SC1 + SC5 South of Locust Hill / Green River
<i>Fisheries (Aquatic Biology - to be identified in terms of stream crossing number)</i>	• Warmwater fisheries (number)	• 0	• 0
	• Coldwater fisheries (number)	• 3, Little Rouge Ck (#7), Major Ck (#11), West Duffins Ck (#12)	• 2, West Duffins Creek (#13), Little Rouge Ck (#8)
	• Extent of riparian vegetation removal (m)	• 140 m. Mature vegetation displaced on Little Rouge and West Duffins Creek	• 360 m. Dense mature mixed forest at West Duffins Creek
	• Altered/displaced habitat/spawning areas (m)	• 480 m, Little Rouge and Duffins Creek to be spanned	• 640 m, Little Rouge and Duffins Creeks to be spanned
<i>Fisheries (Aquatic Biology) cont'd</i>	• Effects on recreational, rare/endangered/threatened species (number/qualitative)	• 6, 3 Regionally/Provincially rare (Stoneroller, Hornyhead Chub, Stonecat), 2 recreational (Brook, Brown Trout), 1 nationally threatened (Redside Dace)	• 6, 3 (Stoneroller, Hornyhead Chub, Stonecat), 2 recreational (Brook, Brown Trout), 1 nationally threatened (Redside Dace)
	• Migratory runs affected (number)	• 1 Salmonid Run (#7)	• 1 Salmonid Run (#8)
	• Nature/extent of habitat rehabilitation programs (MNR, Conservation Authorities) (qualitative)	• MTRC Riparian Protection and Enhancement Plan, MNR stream rehabilitation and Watershed Management Strategies for Little Rouge Creek and West Duffins Creek	• MTRC Riparian Protection and Enhancement Plan, and Watershed Management Strategies for Little Rouge Creek and West Duffins Creek
	• Identified upwelling and seepage areas (number/qualitative)	• 1 moderately high	• 1 High

APPENDIX 12

FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
Vegetation (Terrestrial Biology - to be identified in terms of Vegetation Units)	<ul style="list-style-type: none"> Degree of access to/encroachment on/severance of identified Environmentally Significant Areas (ESA's) and/or Areas of Natural and Scientific Interest (Life and Earth Science ANSI's) (ha) Effects on unique or rare herbaceous species or communities (type) Degree of encroachment on/severance of woodlots/forest areas (ha displaced/total ha (if available)) Nature/extent of forest management/research programs (WIA, plantation, ASA, research plots) (qualitative) 	S2 + C1 + C9 North of Locust Hill / Green River	S3 + S3/SC1 + SC1 + SC5 South of Locust Hill / Green River
		<ul style="list-style-type: none"> No impacts identified 	<ul style="list-style-type: none"> No impacts identified
		<ul style="list-style-type: none"> No impacts identified 	<ul style="list-style-type: none"> No impacts identified
		<ul style="list-style-type: none"> Units 72 (0.3 ha), 73 (1 ha), 84 (9 ha), 87 (3.8 ha): 14.10 ha including mature sugar maple woodlot, streamside cedar mixed woods, and upland mature maple-beech forest 	<ul style="list-style-type: none"> Units 79 (3 ha), 81/82 (1.44 ha/7.5), 85 (1 ha/2), 86 (7.3 ha), 87 (0.5 ha): 13.24 ha includes spruce/larch plantation, mature sugar maple woodlot, mixed streamside cedar woods, upland hardwood species, hardwood and white pines
		<ul style="list-style-type: none"> Minor. Unit 84: plantings of white spruce; some walkways mowed by owner 	<ul style="list-style-type: none"> Minor. Unit 85: 2 ha conifer plantation

FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
		S2 + C1 + C9 North of Locust Hill / Green River	S3 + S3/SC1 + SC1 + SC5 South of Locust Hill / Green River
<i>Wildlife</i>	<ul style="list-style-type: none"> • Effects on wildlife species (qualitative) • Effects on rare/endangered wildlife species (number/qualitative) • Displaced wildlife habitat (ha displaced/total ha (if available)) • Barrier effects on travel corridors (qualitative) 	<ul style="list-style-type: none"> • Major disruption of greenland corridors along Little Rouge and West Duffinss, involving highly diverse successional forest. • 1, regionally uncommon: beaver • Units 72 (0.3 ha/3), 73 (4.5 ha), 84 (9 ha), 87 (3.8 ha): 17.6 ha. • Major. Wide area of severance in valuable corridors along Little Rouge and West Duffinss for deer and furbearers (beaver, mink, muskrat). • 106 ha, 101 ha, 0 ha 	<ul style="list-style-type: none"> • Major disruption of greenland corridors along Little Rouge and West Duffinss, involving highly diverse successional forest. • No impacts identified • Units 77 (3 ha/12), 79 (4 ha), 85 (1 ha/2), 86 (7.3 ha), 87 (0.5 ha): 15.8 ha. • Major. Wide area of severance in valuable corridors along Little Rouge and West Duffinss for deer and furbearers (beaver, mink, muskrat). • 106.6 ha, 63.6 ha, 0 ha
<i>Hydrogeology</i>	<ul style="list-style-type: none"> • Effect on groundwater resource areas (high water table, recharge areas, significant overburden aquifers) (ha) • Private/municipal shallow/deep wells within 150 m of ROW (number) • Encroachment on abandoned/existing waste sites (number) 	<ul style="list-style-type: none"> • 10 wells, 1 shallow, 8 drilled, 1 deep bored • No impacts identified 	<ul style="list-style-type: none"> • 4 wells, 1 shallow, 2 drilled, 1 deep bored • No impacts identified
<i>Waste Management</i>			

FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
		S2 + C1 + C9 North of Locust Hill / Green River	S3 + S3/SC1 + SC1 + SC5 South of Locust Hill / Green River
SOCIAL ENVIRONMENT <i>Communities</i>	<ul style="list-style-type: none"> • Encroachment on/severance of established and proposed settlement areas (qualitative) • Influence in defining settlement areas (qualitative) • Residences displaced (number) • Access to/displacement of community facilities (major institutional uses) (qualitative) • Delivery of community services (emergency, school bus) (qualitative) • Inter-urban and rural-urban barrier effects (qualitative) 	<ul style="list-style-type: none"> • No impacts identified • Highly influential, defines north limit of Locust Hill and Green River, also defines eastern limits of East Markham • 9, 5 residences, 1 PWC land, 3 unknown • Moderate impacts, improved access to Toronto Catholic Cemetery Association future cemetery lands • Low. 6 routes disrupted • No impacts identified 	<ul style="list-style-type: none"> • No impacts identified • Highly influential, reinforces south limits of Locust Hill and Green River, also defines north Seaton • 7 residences • Moderate impacts, improved access to Toronto Catholic Cemetery Association future cemetery lands • Low. 10 routes disrupted • No impacts identified
<i>Recreation</i>	<ul style="list-style-type: none"> • Access to/displacement of recreational uses (qualitative) 	<ul style="list-style-type: none"> • Low potential disturbance of Little Rouge Creek and West Duffinss Creek recreational uses 	<ul style="list-style-type: none"> • High potential to displace Seaton Hiking Trail and Seaton Flying Club at West Duffinss Creek Valley

FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
		S2 + C1 + C9 North of Locust Hill / Green River	S3 + S3/SC1 + SC1 + SC5 South of Locust Hill / Green River
<i>Visual Aesthetics</i> (View from the facility)	<ul style="list-style-type: none"> Total aesthetic value of visibly accessible landscape components (qualitative/scenic value) Total scenic value based on composition, arrangement and sequence of landscape components (qualitative/scenic value) Total potential visual impact on sensitive viewer groups based on sensitivity, proximity and frequency of viewer groups (qualitative/scenic value) 	<ul style="list-style-type: none"> Open fields with vegetation, vegetation associated with Little Rouge/West Duffins Creek Valleys (+ 2) Gently rolling views with skyline of city, alignment curvilinear allowing views to the north (+ 2) Scattered dwellings in area, alignment along north side of Locust Hill (-3) 	<ul style="list-style-type: none"> Aesthetic vegetation in Little Rouge, West Duffins Creek, rolling hills (+ 2) Flat landscape to slightly rolling, short flat stretch with limited variety (+ 2) Proximity to Locust Hill/Green River community (-3)
	<i>Noise</i>	<ul style="list-style-type: none"> 11 residences impacted, 3 (5-10 db), 6 (10-15 db), 2 (15-20) db 11 residences impacted, 3 (55-60) db, 4 (60-65 db), 4 (65-70 db) 	<ul style="list-style-type: none"> 4 residences impacted, 4 (5-10 db) 2 residences impacted, 1 (60-65 db), 1 (65-70 db)

FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
ECONOMIC ENVIRONMENT <i>Provincial/Municipal/Private Land Use Development Strategies</i>	<ul style="list-style-type: none"> Degree of compatibility with municipal development goals/objectives (high/moderate/low) Capability to provide transportation service/stimulate development of major development initiatives (Seaton, Pickering Airport) (high/moderate/low) Compatibility with Provincial/Federal planning goals/objectives/policies (high/moderate/low) Constraints/opportunities for designated settlement area expansion (qualitative) Population/employment redistribution effects (qualitative) 	S2 + C1 + C9 North of Locust Hill / Green River	S3 + S3/SC1 + SC1 + SC5 South of Locust Hill / Green River
		<ul style="list-style-type: none"> Moderate, not compatible with Durham OP and Pickering's land use objectives. May create pressure for non-agricultural uses in east Markham. May locate pressure for unplanned growth of Locust Hill and Green River. May constrain East Markham Project development in southeast corner High, favours Airport over Seaton, good service provided to East Markham Project Moderate, some conflict with community facility uses in southeast corner of East Markham Project. Potential conflict with federal Pickering Airport planning Low, constrains expansion of Locust Hill to the west, and Green River to the south Moderate, potential to redistribute employment from north Seaton into federal Pickering Lands; encourage residential uses in north Seaton; potential integration of services of Green River and Seaton 	<ul style="list-style-type: none"> Moderate, not fully compatible with Durham OP and Pickering's land use objectives. May create pressure for non-agricultural uses in east Markham. May create pressure for unplanned growth of Locust Hill and Green River High favours Airport over Seaton but retains flexibility to service Seaton. Good service provided to East Markham Project High, regard for preservation of linear open space corridors, water resources and agricultural lands in North Pickering. Reinforces Seaton objective of buffer for Green River. Potential conflict with federal Pickering Airport planning Low, allows expansion of Locust Hill and Green River to the north Moderate, potential to redistribute employment from north Seaton into federal Pickering Lands, encourage residential uses in north Seaton

FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
		S2 + C1 + C9 North of Locust Hill / Green River	S3 + S3/SC1 + SC1 + SC5 South of Locust Hill / Green River
<i>Non-Farm Commercial Activities</i>	• Businesses displaced (number)	• 1	• No impacts identified
	• Employees displaced (number)	• 5	• No impacts identified
	• Changes (+/-) in business exposure (qualitative)	• Moderate, reduction in regional traffic for businesses on Hwy 7 in Locust Hill and Green River, increased along York Rd 30	• Moderate, reduction in regional traffic for businesses on Hwy 7 in Locust Hill and Green River, increased along York Rd 30
	• Changes in site access/internal circulation (qualitative)	• Possible access modification to Greenhouses (Lot 11, Con 9) due to grade separation at Tenth Line	• No impacts identified
AGRICULTURE <i>Physical Resource Consumption</i>	• Loss of Class 1 and Class 2 land (ha)	• 178.1 ha, primarily Class 1, no limitations	• 193.7 ha, 70-80% Class 1, no limitations. Class 2, topographic limitations at Little Rouge, West Duffins Creeks
	• Loss of Class 3 and Class 4 land (ha)	• 3.2 ha, <10% of total link area	• 3.2 ha, <10% of total link area
	• Total farm property required (ha)	• 85.7 ha	• 92.46 ha

FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
		S2 + C1 + C9 North of Locust Hill / Green River	S3 + S3/SC1 + SC1 + SC5 South of Locust Hill / Green River
<i>Facility Resource Consumption</i>	<ul style="list-style-type: none"> ● Farm buildings/structures displaced (number/quality) 	<ul style="list-style-type: none"> ● 5, 1 house, 2 barns, 2 silos. 	<ul style="list-style-type: none"> ● 11, 5 houses, 2 barns, 4 unidentified (tenant occupied on ORC lands)
	<ul style="list-style-type: none"> ● Specialty crop (rootstocks) displaced (type/ ha) 	<ul style="list-style-type: none"> ● No impacts identified 	<ul style="list-style-type: none"> ● No impacts identified
	<ul style="list-style-type: none"> ● Total owned land required (ha) 	<ul style="list-style-type: none"> ● 0.98 ha. Predominantly ORC, PWC land 	<ul style="list-style-type: none"> ● No impacts identified. ORC land
	<ul style="list-style-type: none"> ● Improved land required (ha) 	<ul style="list-style-type: none"> ● No impacts identified 	<ul style="list-style-type: none"> ● No impacts identified
	<ul style="list-style-type: none"> ● Total farm properties directly affected (number) 	<ul style="list-style-type: none"> ● 11, 8 cash crop, 1 horse, 1 beef, 1 dairy. 	<ul style="list-style-type: none"> ● 8, 6 cash crop, 1 horse, 1 beef. Includes Highway 7 relocation effects on Pike
	<ul style="list-style-type: none"> ● Livestock operations (field/facility) affected (number/type) 	<ul style="list-style-type: none"> ● 3, 1 horse, 1 beef, 1 dairy 	<ul style="list-style-type: none"> ● 2, 1 horse, 1 beef
	<ul style="list-style-type: none"> ● Specialty operations affected (number) 	<ul style="list-style-type: none"> ● No impacts identified 	<ul style="list-style-type: none"> ● No impacts identified
	<ul style="list-style-type: none"> ● Farm properties > 20 ha affected (number) 	<ul style="list-style-type: none"> ● 11 properties 	<ul style="list-style-type: none"> ● 7 properties
	<ul style="list-style-type: none"> ● Severed parcels > 20 ha (number) 	<ul style="list-style-type: none"> ● 7 parcels 	<ul style="list-style-type: none"> ● 3 parcels
	<ul style="list-style-type: none"> ● Severed parcels < 20 ha (number) 	<ul style="list-style-type: none"> ● 10 parcels 	<ul style="list-style-type: none"> ● 9 parcels
<i>Farm Operation Impacts</i>	<ul style="list-style-type: none"> ● Intra-property movement patterns affected (number) 	<ul style="list-style-type: none"> ● 6, 2 parcels landlocked 	<ul style="list-style-type: none"> ● 7, 4 parcels landlocked

FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
		S2 + C1 + C9 North of Locust Hill / Green River	S3 + S3/SC1 + SC1 + SC5 South of Locust Hill / Green River
<i>Area Operation Impacts</i>	<ul style="list-style-type: none"> Transportation routes affected (number) Division of agricultural community areas (number) 	<ul style="list-style-type: none"> 6 roads, Hwy 7, 10th Line, York Road 30, Sidelines 32, 30 and 28 Some separation of agricultural hinterland from Locust Hill and Green River 	<ul style="list-style-type: none"> 6, Hwy 7, York Road 30, 10th & 11th Lines, Sidelines 30 and 28 Some separation of agricultural hinterland from Locust Hill and Green River
CULTURAL ENVIRONMENT <i>Historical Resources</i>	<ul style="list-style-type: none"> Features within 100 m of ROW (exceptional/moderate/ordinary) Features within ROW (exceptional/moderate/ordinary) 	<ul style="list-style-type: none"> 3, 1 ordinary residence, 1 moderate farm, 1 moderate historic marker 1, 1 ordinary residence 	<ul style="list-style-type: none"> 1, 1 ordinary residence 2, 2 ordinary residences
<i>Cultural Landscape</i>	<ul style="list-style-type: none"> Degree of disruption to landscape units (major/moderate/minor) 	<ul style="list-style-type: none"> Moderate, rural lands with heritage sites and historical settlements (Locust Hill), close to hamlet of Green River 	<ul style="list-style-type: none"> High, heritage sites/historical settlements of Locust Hill, Green River, Whitevale, and Little Rouge Creek (moderate),
<i>Archaeological Resources</i>	<ul style="list-style-type: none"> Registered sites within ROW (number/type) Potentially significant sites/resource areas affected (number/type) 	<ul style="list-style-type: none"> 1 site, Pike Site (AIGt-34, Aceramic campsites). Significant 2 sites, Burkholder Site (AIGt-19, Woodland campsites), Herceg Site (AIGs-65, isolated findspot, not significant). Encroachment on historically recorded pine stand 	<ul style="list-style-type: none"> 1 site, Ansell Site (AIGt-29, Archaic campsites). Significant 3 sites, Park Site (AIGt-28, Archaic campsites, significant) Herceg Site (AIGs 65, isolated findspot, not significant). Encroachment on historically recorded pine stand

FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
		S2 + C1 + C9 North of Locust Hill / Green River	S3 + S3/SC1 + SC1 + SC5 South of Locust Hill / Green River
TRANSPORTATION AND ENGINEERING <i>Network Configuration and Traffic Service</i>	<ul style="list-style-type: none"> Interchange conditions (qualitative) Degree of compatibility with provincial road system (existing/proposed) (high/moderate/low) Degree of compatibility with municipal road system (existing/proposed) (high/moderate/low) Degree of compatibility with protection for transit objectives (high/moderate/low) Degree to which existing/future travel demand is satisfied (Overview Study/traffic modelling) (high/moderate/low) 	<ul style="list-style-type: none"> Fair. Non-standard at MBP. Modified design to accommodate Hwy 7 ramp, 60° skew I/C at RR30 Moderate. RR30 I/C in close proximity to Hwy 7 Moderate. 10th Line denied access to Hwy 407 Moderate. High cost, difficult construction at RR30, gradient difference > 5m High. Majority of traffic demand to the north and south of Hwy 407 	<ul style="list-style-type: none"> Good. Non-standard I/C at RR 30 skewed 55° Low. Hwy 7 realignment at RR30 Moderate. 11 Con Rd, SL34, 10th Line closed High. Raise Hwy 7 4m High. Majority of traffic demand to the north
	Geometrics	<ul style="list-style-type: none"> Horizontal alignment (# of radii, curve lengths/ route segment length) (qualitative) Vertical alignment (length of fill > 5m/ cut > 5m, noteworthy max grades) (qualitative) 	<ul style="list-style-type: none"> Fair. 2, (2-2000m), 1935/7780 Fair/good. 850/1600, fill > 10m for 100m

FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
		S2 + C1 + C9 North of Locust Hill / Green River	S3 + S3/SC1 + SC1 + SC5 South of Locust Hill / Green River
<i>Geotechnical</i>	<ul style="list-style-type: none"> Potential engineering/environmental problems due to geotechnical conditions (qualitative) 	<ul style="list-style-type: none"> Poor foundation conditions at Little Rouge and West Duffins Creek shallow soft subgrade for 200m 	<ul style="list-style-type: none"> Poor foundation conditions at Little Rouge and West Duffins Creek
	<ul style="list-style-type: none"> Effects on aggregate resources (type/ha) 	<ul style="list-style-type: none"> No impacts identified 	<ul style="list-style-type: none"> No impacts identified
<i>Staging Options</i>	<ul style="list-style-type: none"> East of construction staging (high/moderate/low) 	<ul style="list-style-type: none"> High. No problems. Opportunity to connect Hwy 7 	<ul style="list-style-type: none"> High. No impacts identified
<i>Construction Considerations</i>	<ul style="list-style-type: none"> Major impacts during construction (road/access closures, detours, utilities/rail conflicts) (qualitative) 	<ul style="list-style-type: none"> Difficult. Interchange RR30 bounded by CPR and West Duffins Ck 	<ul style="list-style-type: none"> No impacts identified
<i>Cost</i>	<ul style="list-style-type: none"> Length (m) 	<ul style="list-style-type: none"> 7970 m 	<ul style="list-style-type: none"> 7580 m
	<ul style="list-style-type: none"> Construction cost (earthworks, roadworks, structures) (1990 dollars) 	<ul style="list-style-type: none"> \$161.0 M, higher due to detours 	<ul style="list-style-type: none"> \$134.6 M
	<ul style="list-style-type: none"> Relocation cost (1990 dollars) 	<ul style="list-style-type: none"> \$0 M 	<ul style="list-style-type: none"> \$1.8 M, relocate 1.5 km of Hwy 7
	<ul style="list-style-type: none"> Public property affected (number) 	<ul style="list-style-type: none"> 28 properties 	<ul style="list-style-type: none"> 36 properties
	<ul style="list-style-type: none"> Private property affected (number) 	<ul style="list-style-type: none"> 11 properties 	<ul style="list-style-type: none"> 4 properties
	<ul style="list-style-type: none"> Property cost (1990 dollars for forecast land use) 	<ul style="list-style-type: none"> \$13.3 M 	<ul style="list-style-type: none"> \$13.3 M
	<ul style="list-style-type: none"> Construction, utilities and property cost (1990 dollars) 	<ul style="list-style-type: none"> \$174.3 M 	<ul style="list-style-type: none"> \$154.0 M

**APPENDIX 13
COMPARISON TABLE OF
POTENTIAL IMPACTS STAGE 5**

FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
		S3/SC1 + SC1 + SC5 + C10 Through Pickering Airport Site	S3/SC5 + S5 + S6 + SC3 Through Seaton Community
NATURAL ENVIRONMENT <i>Ecosystem Integrity</i>	<ul style="list-style-type: none"> Severance of/encroachment on identified upland ecosystems (ha) Severance of/encroachment on identified aquatic ecosystems (ha) 	<ul style="list-style-type: none"> No impacts identified Crosses West Duffins Creek south of Green River 	<ul style="list-style-type: none"> No impacts identified Crosses West Duffins Creek south of Green River Encroachment on coldwater tributaries to Duffins Creek southwest of Brougham
	<ul style="list-style-type: none"> Severance of/encroachment on identified wetland ecosystems (ha) 	<ul style="list-style-type: none"> No impacts identified 	<ul style="list-style-type: none"> No impacts identified
	<ul style="list-style-type: none"> Watercourse crossings (number) Encroachment on headwater areas (ha) Realignment/channelization required (m) Effects on surface drainage/flood plain (qualitative) Nature/extent of management programs (MOEE, Conservation Authorities) (qualitative) 	<ul style="list-style-type: none"> 8, 6 intermittent streams, 2 permanent watercourses 0 ha, 960 m No impacts identified MTRC Duffins Creek Basin Management Strategy 	<ul style="list-style-type: none"> 13, 10 intermittent streams, 3 permanent water courses 215 ha 350 m Significant, re-grade wetland for I/C at Sideline 24, fill in gravel pit & pond MTRC Duffins Creek Basin Management Strategy
Surface Water Quality and Quantity			

FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
		S3/SC1 + SC1 + SC5 + C10 Through Pickering Airport Site	S3/SC5 + S5 + S6 + SC3 Through Seaton Community
<i>Fisheries (Aquatic Biology - to be identified in terms of stream crossing number)</i>	<ul style="list-style-type: none"> Warmwater fisheries (number) Coldwater fisheries (number) Extent of riparian vegetation removal (m) Altered/displaced habitat/spawning areas (m) 	<ul style="list-style-type: none"> No crossings identified 2, West Duffins Creek (#43), Lot 14 (#43) 340 m 160 m, potential to affect coldwater habitat and potential spawning area 	<ul style="list-style-type: none"> No crossings identified 3, West Duffins Creek (#13), Lot 16 (#37), Lot 14 (#43) 525 m 1531 m, moderate potential to disrupt West Duffins Creek
<i>Fisheries (Aquatic Biology) cont'd</i>	<ul style="list-style-type: none"> Effects on recreational, rare/endangered/threatened species (number/qualitative) Migratory runs affected (number) Nature/extent of habitat rehabilitation programs (MNR, Conservation Authorities) (qualitative) Identified upwelling and seepage areas (number/qualitative) 	<ul style="list-style-type: none"> 2 recreational species (Brown, Brook Trout) No impacts identified MTRC Riparian Protection and Enhancement Plan, and MTRC Duffins Creek Basin Management Strategy 2, 1 high, 1 moderately high 	<ul style="list-style-type: none"> 2 recreational species (Brown, Brook Trout) No impacts identified MTRC Riparian Protection and Enhancement Plan, and MTRC Duffins Creek Basin Management Strategy 5, 3 high, 2 moderately high

FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
		S3/SC1 + SC1 + SC5 + C10 Through Pickering Airport Site	S3/SC5 + S5 + S6 + SC3 Through Seaton Community
Vegetation (Terrestrial Biology - to be identified in terms of Vegetation Units)	<ul style="list-style-type: none"> Degree of access to/encroachment on/severance of identified Environmentally Significant Areas (ESA's) and/or Areas of Natural and Scientific Interest (Life and Earth Science ANSI's) (ha) 	<ul style="list-style-type: none"> No impacts identified 	<ul style="list-style-type: none"> Unit 78: 3 ha encroachment on northern edge of Whitevale Corridor ESA
	<ul style="list-style-type: none"> Effects on unique or rare herbaceous species or communities (type) 	<ul style="list-style-type: none"> No impacts identified 	<ul style="list-style-type: none"> Cases' Ladies' tresses is regionally rare, found West Duffins Ck
	<ul style="list-style-type: none"> Degree of encroachment on/severance of woodlots/forest areas (ha displaced/total ha (if applicable)) 	<ul style="list-style-type: none"> Units 54 (1.8 ha/2), 55 (2 ha/3), 56 (1 ha/1), 79 (3 ha): 7.8 ha including mixed streamside cedar, lowland woods with large willows, birch, elm, poplar, pine/spruce plantation, and white ash/black locust deciduous woodlot 	<ul style="list-style-type: none"> Units 54 (1.8 ha/2), 55 (2 ha/3), 67 (1.6 ha), 68 (1 ha/8), 70 (0.4 ha/0.4), 74 (1.7 ha), 75 (2 ha), 78 (6 ha): 16.5 ha containing lowland mixed cedar woods, mature maple-beech woodlot, mixed streamside cedar, hardwood, white elm, white pine, red oak, poplar, birch and beech
	<ul style="list-style-type: none"> Nature/extent of forest management/research programs (WIA, plantation, ASA, research plots) (qualitative) 	<ul style="list-style-type: none"> No impacts identified 	<ul style="list-style-type: none"> Minor. Unit 56: 0.5 ha encroachment on 1 ha pine/spruce plantation

FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
<i>Wildlife</i>	<ul style="list-style-type: none"> Effects on wildlife species (qualitative) Effects on rare/endangered wildlife species (number/qualitative) Displaced wildlife habitat (ha displaced/total ha (if applicable)) Barrier effects on travel corridors (qualitative) 	S3/SC1 + SC1 + SC5 + C10 Through Pickering Airport Site	S3/SC5 + S5 + S6 + SC3 Through Seaton Community
		<ul style="list-style-type: none"> Major disruption of greenland corridor along West Duffins Ck. Removal of man-made pond and adjacent wet area in Unit 54/55 complex affects local small game, deer, and waterfowl habitat. No impacts identified Units 54 (1.8 ha/2), 55 (2 ha/3), 56 (1 ha/1), 77 (3 ha/12), 79 (4 ha): 11.8 ha Major. Wide area of severance in valuable corridors along West Duffins for deer and furbearers (beaver, mink, muskrat). Minimal impact elsewhere due to isolation of habitat areas. 	<ul style="list-style-type: none"> Major disruption of greenland corridor along West Duffins Ck containing area of deer concentration. Removal of man-made pond and adjacent wet area in Unit 55 affects local small game, deer, and waterfowl habitat. Removal of old field/scrub woodland impacts available summer food for local deer populations. Loss of wetland in Unit 69 impacts waterfowl and amphibians. No impacts identified Units 48 (1 ha/1), 54 (1.8 ha/2), 55 (2 ha/3), 56 (1 ha/1), 59 (1 ha/2), 60 (2 ha/13), 67 (1.6 ha), 68 (1.5 ha/8), 69 (2.7 ha/5), 70 (0.4 ha/0.4), 74 (1.7 ha) 75 (2 ha), 76 (2.1 ha)/12, 78 (6 ha): 26.8 ha Major. Wide area of severance in valuable corridors along West Duffins for deer and furbearers (beaver, mink, muskrat). Minimal impact elsewhere due to isolation of habitat areas.
	<i>Hydrogeology</i> <ul style="list-style-type: none"> Effect on groundwater resource areas (high water table, recharge areas, significant overburden aquifers) (ha) Private/municipal shallow/deep wells within 150 m of ROW (number) 	<ul style="list-style-type: none"> 137 ha, 181 ha, 0 ha 10 wells, 6 drilled, 4 deep bored 	<ul style="list-style-type: none"> 104 ha, 96 ha, 0 ha 6 wells, 1 shallow, 5 drilled

FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
		S3/SC1 + SC1 + SC5 + C10 Through Pickering Airport Site	S3/SC5 + S5 + S6 + SC3 Through Seaton Community
<i>Waste Management</i>	<ul style="list-style-type: none"> • Encroachment on abandoned/existing waste sites (number) 	<ul style="list-style-type: none"> • No impacts identified 	<ul style="list-style-type: none"> • No impacts identified
SOCIAL ENVIRONMENT <i>Communities</i>	<ul style="list-style-type: none"> • Encroachment on/severance of established and proposed settlement areas (qualitative) 	<ul style="list-style-type: none"> • Cuts through Seaton Lands south of Hwy 7 	<ul style="list-style-type: none"> • Cuts through Seaton Lands south of Hwy 7
	<ul style="list-style-type: none"> • Influence in defining settlement areas (qualitative) 	<ul style="list-style-type: none"> • High, define south limit of Green River and north limit of Brougham, also defines area of potential airport-related developments 	<ul style="list-style-type: none"> • High, define south limit of Brougham and south limit of Green River, also defines north Seaton
	<ul style="list-style-type: none"> • Residences displaced (number) 	<ul style="list-style-type: none"> • 19, 14 residences, 5 unknown 	<ul style="list-style-type: none"> • 17 ORC lands
	<ul style="list-style-type: none"> • Access to/displacement of community facilities (major institutional uses) (qualitative) 	<ul style="list-style-type: none"> • No impacts identified 	<ul style="list-style-type: none"> • No impacts identified
	<ul style="list-style-type: none"> • Delivery of community services (emergency, school bus) (qualitative) 	<ul style="list-style-type: none"> • Low. 12 routes disrupted 	<ul style="list-style-type: none"> • Low. 23 routes disrupted
<i>Recreation</i>	<ul style="list-style-type: none"> • Inter-urban and rural-urban barrier effects (qualitative) 	<ul style="list-style-type: none"> • No impacts identified 	<ul style="list-style-type: none"> • No impacts identified
	<ul style="list-style-type: none"> • Access to/displacement of recreational uses (qualitative) 	<ul style="list-style-type: none"> • High potential to displace Seaton Hiking Trail and Seaton Flying Club at West Duffins Valley 	<ul style="list-style-type: none"> • High potential to displace Seaton Hiking Trail, Seaton Flying Club, and Pickering Rod & Gun Club

FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
		S3/SC1 + SC1 + SC5 + C10 Through Pickering Airport Site	S3/SC5 + S5 + S6 + SC3 Through Seaton Community
<i>Visual Aesthetics</i> (View from the facility)	<ul style="list-style-type: none"> Total aesthetic value of visibly accessible landscape components (qualitative/scenic value) Total scenic value based on composition, arrangement and sequence of landscape components (qualitative/scenic value) Total potential visual impact on sensitive viewer groups based on sensitivity, proximity and frequency of viewer groups (qualitative/scenic value) 	<ul style="list-style-type: none"> West Duffins Creek vegetation, rolling & open fields, some farmsteads (+2) Flat stretch with limited variety, some views to the north (+2) Proximity to Green River, Brougham (-2) 	<ul style="list-style-type: none"> Very scenic in easterly section, otherwise moderate for majority of segment (+3) Rolling landscape, vista of large valley to east (+3) Few houses in area, local impact in Brougham (-2)
	<i>View of the facility</i>		
<i>Noise</i>	<ul style="list-style-type: none"> Noise sensitive receivers experiencing changes (+/-) in sound levels (5 dB intervals) over pre-existing conditions (number) Noise sensitive receivers experiencing resultant absolute noise level over 55 db) (number) 	<ul style="list-style-type: none"> 11 residences impacted, 8 (5-10 db), 2 (10-15 db), 1 (15-20) db 8 residences impacted, 2 (55-60) db, 3 (60-65 db), 3 (65-70 db) 	<ul style="list-style-type: none"> 2 residences impacted, 1 (5-10 db), 1 (10-15 db) 2 residences impacted, 1 (55-60 db), 1 (60-65 db)

FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
		S3/SC1 + SC1 + SC5 + C10 Through Pickering Airport Site	S3/SC5 + S5 + S6 + SC3 Through Seaton Community
ECONOMIC ENVIRONMENT <i>Provincial/Municipal/Private Land Use Development Strategies</i>	<ul style="list-style-type: none"> Degree of compatibility with municipal development goals/objectives (high/moderate/low) 	<ul style="list-style-type: none"> Moderate, not compatible with Durham/ Pickering land use objectives for 407 	<ul style="list-style-type: none"> Moderate, only partially compatible with Durham/ Pickering land use objectives for 407, but does reinforce south limit of Brougham. Town of Pickering initially preferred route north of Brougham to buffer hamlet from Pickering Airport
	<ul style="list-style-type: none"> Capability to provide transportation service/stimulate development of major development initiatives (Seaton, Pickering Airport) (high/moderate/low) 	<ul style="list-style-type: none"> High favours Airport but retains some flexibility to service Seaton. Good service to peripheral airport development 	<ul style="list-style-type: none"> Moderate, favours Seaton over Airport, lower stimulus for airport growth. Retains flexibility for dedicated access for Airport
	<ul style="list-style-type: none"> Compatibility with Provincial/Federal planning goals/objectives/policies (high/moderate/low) 	<ul style="list-style-type: none"> High, regard for preservation of linear open space corridor and water resources. Potential conflict with Airport air-side facilities and peripheral land uses. Buffers only Green River from Seaton 	<ul style="list-style-type: none"> High, regard for preservation of linear open space corridor and water resources. Moderately compatible with Seaton transportation/employment objectives, not environmental ("green community"), open space, housing or agricultural objectives (less space available for these uses). Buffers Green River and Brougham from Seaton
	<ul style="list-style-type: none"> Constraints/opportunities for designated settlement area expansion (qualitative) 	<ul style="list-style-type: none"> Some opportunity for southerly expansion of Green River (Airport will restrict easterly growth). Together with Airport, constrains northerly growth of Brougham. Southern, eastern expansion possible. 	<ul style="list-style-type: none"> Some opportunity for southerly expansion of Green River. Constrains growth of Brougham to the south; some easterly expansion possible

FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
		S3/SC1 + SC1 + SC5 + C10 Through Pickering Airport Site	S3/SC5 + S5 + S6 + SC3 Through Seaton Community
<i>Provincial/Municipal/Private Land Use Development Strategies</i> (cont'd)	<ul style="list-style-type: none"> Population/employment redistribution effects (qualitative) 	<ul style="list-style-type: none"> Moderate, potential to lure employment from north Seaton into federal Pickering Lands. Encourages residential uses in north Seaton. Flexibility to integrate services for Brougham, Green River, and possible airport-related developments and/or Seaton 	<ul style="list-style-type: none"> Potential to restrict population distribution in north Seaton but no significant divergence from Region of Durham strategy
	<ul style="list-style-type: none"> Effects on approved private development proposals (qualitative) 	<ul style="list-style-type: none"> No impacts identified 	<ul style="list-style-type: none"> No impacts identified
	<ul style="list-style-type: none"> Businesses displaced (number) Employees displaced (number) Changes (+/-) in business exposure (qualitative) Changes in site access/internal circulation (qualitative) 	<ul style="list-style-type: none"> 1 business 5 Moderate, reduction in regional traffic along Hwy 7 in Locust Hill, Green River, and Brougham, increased exposure along Brock Road to northbound freeway seeking traffic No impacts identified 	<ul style="list-style-type: none"> 1 business 5 Moderate, reduction in regional traffic along Hwy 7 in Locust Hill, Green River, and Brougham, increased exposure at Brock Road in north Brougham No impacts identified
AGRICULTURE <i>Physical Resource Consumption</i>	<ul style="list-style-type: none"> Loss of Class 1 and Class 2 land (ha) 	<ul style="list-style-type: none"> 233.9 ha, predominantly Class 1, no limitations. Topographic limitations at West Duffins Creek 	<ul style="list-style-type: none"> 221.0 ha, predominantly Class 1, no limitations. Topographic limitations at West Duffins Creek and Duffins Creek
	<ul style="list-style-type: none"> Loss of Class 3 and Class 4 land (ha) 	<ul style="list-style-type: none"> No impacts identified 	<ul style="list-style-type: none"> No impacts identified
	<ul style="list-style-type: none"> Total farm property required (ha) 	<ul style="list-style-type: none"> 28.8 ha 	<ul style="list-style-type: none"> 25.4 ha

FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
		S3/SC1 + SC1 + SC5 + C10 Through Pickering Airport Site	S3/SC5 + S5 + S6 + SC3 Through Seaton Community
<i>Facility Resource Consumption</i>	<ul style="list-style-type: none"> Farm buildings/structures displaced (number/quality) Specialty crop (rootstocks) displaced (type/ ha) Total owned land required (ha) Improved land required (ha) 	<ul style="list-style-type: none"> 4, 2 houses, 2 barns/sheds (fair condition). ORC tenant occupied 6.4 ha, nursery stock 28.8 ha No impacts identified 	<ul style="list-style-type: none"> 15, 3 houses, 12 barns/sheds (poor to fair condition). ORC tenant occupied 4.0 ha, nursery stock 26.4 ha No impacts identified
	<ul style="list-style-type: none"> Total farm properties directly affected (number) Livestock operations (field/facility) affected (number/type) Specialty operations affected (number/type) 	<ul style="list-style-type: none"> 8, 4 cash crop, 1 horse, 2 beef, 1 nursery. 3, 1 horse, 2 beef 1 nursery (Dutchmaster). Servers, requires 15% (6.4 ha) of parcel (major adverse impacts, could jeopardize continuance of operation) 	<ul style="list-style-type: none"> 6, 2 cash crop, 1 horse, 1 beef, 1 dairy, 1 nursery. 3, 1 horse, 1 beef, 1 dairy 1 nursery. Impacts to Dutchmaster limited to encroachment on southeast corner (4.0 ha)
	<ul style="list-style-type: none"> Farm properties > 20 ha affected (number) Severed parcels > 20 ha (number) Severed parcels < 20 ha (number) Intra-property movement patterns affected (number) 	<ul style="list-style-type: none"> 6 properties 1 parcel 4 parcels 7, 1 landlocked 	<ul style="list-style-type: none"> 6 properties 4 parcels 9 parcels 7, alternative access for beef operation on ORC lands is awkward

FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
		S3/SC1 + SC1 + SC5 + C10 Through Pickering Airport Site	S3/SC5 + S5 + S6 + SC3 Through Seaton Community
<i>Area Operation Impacts</i>	<ul style="list-style-type: none"> Transportation routes affected (number) 	<ul style="list-style-type: none"> 10 roads, Hwy 7, Sidelines 30, 28, 26, 24, 22, 20, 16, 14, and Brock Road 	<ul style="list-style-type: none"> 9 roads, Hwy 7, North Rd, Sidelines 28, 26, 24, 22, 16, 14, and Brock Road. Possible temporary disruption due to realignment of Sideline 16
	<ul style="list-style-type: none"> Division of agricultural community areas (qualitative) 	<ul style="list-style-type: none"> Some separation of agricultural hinterland from Brougham 	<ul style="list-style-type: none"> Some separation of agricultural hinterland from Brougham
CULTURAL ENVIRONMENT <i>Historical Resources</i>	<ul style="list-style-type: none"> Features within 100 m of ROW (exceptional/moderate/ordinary) 	<ul style="list-style-type: none"> 5, 1 excellent, 3 ordinary residences, 1 ordinary farm 	<ul style="list-style-type: none"> 4, 2 ordinary residences, 2 moderate residences
	<ul style="list-style-type: none"> Features within ROW (exceptional/moderate/ordinary) 	<ul style="list-style-type: none"> 6, 6 ordinary residences including 4 with group value in Brougham 	<ul style="list-style-type: none"> 5, 3 moderate residences, 1 moderate farm, 1 ordinary farm
<i>Cultural Landscape</i>	<ul style="list-style-type: none"> Degree of disruption to landscape units (major/moderate/minor) 	<ul style="list-style-type: none"> High, encroachment on heritage/historical settlements of Green River and Whitevale, Hwy 7 corridor, and agricultural landscape 	<ul style="list-style-type: none"> High, encroachment on heritage/historical settlements of Green River and Whitevale, Hwy 7 corridor, and agricultural landscape
	<ul style="list-style-type: none"> Registered sites within ROW (number/type) 	<ul style="list-style-type: none"> 2 sites, Hobbs Site (AIGs-82, isolated findspot, not significant), Webb Site II (AIGs-73, 1.2 ha Iroquoian Village, significant) 	<ul style="list-style-type: none"> 1 site, Salgo Site (AIGs-27, Archaic campsite, significant)
<i>Archaeological Resources</i>	<ul style="list-style-type: none"> Potentially significant sites/resource areas affected (number/type) 	<ul style="list-style-type: none"> 3 sites, Park Site (AIGt-28, Archaic camp site, significant), Hecceg Site (AIGs-65, isolated findspot, not significant), Peter Webb Site I (AIGs-78, Iroquoian Village, significant). Encroachment on historically recorded pine stand 	<ul style="list-style-type: none"> Encroachment on historically recorded pine stand

FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
		S3/SC1 + SC1 + SC5 + C10 Through Pickering Airport Site	S3/SC5 + S5 + S6 + SC3 Through Seaton Community
TRANSPORTATION AND ENGINEERING <i>Network Configuration and Traffic Service</i>	<ul style="list-style-type: none"> Interchange conditions (qualitative) Degree of compatibility with provincial road system (existing/proposed) (high/moderate/low) Degree of compatibility with municipal road system (existing/proposed) (high/moderate/low) Degree of compatibility with protection for transit objectives (high/moderate/low) Degree to which existing/future travel demand is satisfied (Overview Study/traffic modelling) (high/moderate/low) 	<ul style="list-style-type: none"> Fair. Non-standard, 55° I/C at Sideline 30, 70° I/C at SL14 High. Grade separation with Hwy 7, skew < 35° High. I/C at SL 30, close SL's 34, 24, 20 High. Raise Hwy 7 4m Moderate 	<ul style="list-style-type: none"> Good. Non-standard, 55° I/C at SL14 High High. Close ROW for SL's 34, 26, 28, 20 & 22 Moderate. High cost. Grading differential > 5m at Brock Road Moderate. 58% of traffic through residential area
	Geometrics	<ul style="list-style-type: none"> Fair/Good. 2, (1700m, 5250m), 1985/9270 Fair. 1600m/350m, cut > 10m for 350m, fill > 10m for 150m. Long length (2.8 km) of steep grade (2.2%) 	<ul style="list-style-type: none"> Fair. 3, (1-2000m, 2-1500m), 3250/9290 Fair. 2350/2250, cut section > 10m for 350m, cut > 10m for 150m. Maximum grades less than 1.1%.

FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
		S3/SC1 + SC1 + SC5 + C10 Through Pickering Airport Site	S3/SC5 + S5 + S6 + SC3 Through Seaton Community
<i>Geotechnical</i>	<ul style="list-style-type: none"> Potential engineering/environmental problems due to Geotechnical conditions (qualitative) Effects on aggregate resources (type/ha) 	<ul style="list-style-type: none"> Acceptable, poor foundation conditions at West Duffins Creek No impacts identified 	<ul style="list-style-type: none"> Problems, 300m of shallow soft subgrade No impacts identified
	<i>Staging Options</i>	<ul style="list-style-type: none"> Moderate. Major disadvantage, directs majority of traffic through residential area 	<ul style="list-style-type: none"> High. No problems, avoids directing majority of traffic through Brougham area
<i>Construction Considerations</i>	<ul style="list-style-type: none"> Major impacts during construction (road/access closures, detours, utilities/rail conflicts) (qualitative) 	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> None
<i>Cost</i>	<ul style="list-style-type: none"> Length (m) 	<ul style="list-style-type: none"> 9260 m 	<ul style="list-style-type: none"> 9290 m
	<ul style="list-style-type: none"> Construction cost (earthworks, roadworks, structures) (1990 dollars) 	<ul style="list-style-type: none"> \$144.8 M 	<ul style="list-style-type: none"> \$134.6 M
	<ul style="list-style-type: none"> Relocation cost (1990 dollars) 	<ul style="list-style-type: none"> \$0 M 	<ul style="list-style-type: none"> \$0 M
	<ul style="list-style-type: none"> Public property affected (number) 	<ul style="list-style-type: none"> 47 properties 	<ul style="list-style-type: none"> 40 properties
	<ul style="list-style-type: none"> Private property affected (number) 	<ul style="list-style-type: none"> 7 properties 	<ul style="list-style-type: none"> 6 properties
	<ul style="list-style-type: none"> Property cost (1990 dollars for forecast land use) Construction, utilities and property cost (1990 dollars) 	<ul style="list-style-type: none"> \$17.8 M \$166.9 M 	<ul style="list-style-type: none"> \$13.4 M \$148.0 M

**APPENDIX 14
COMPARISON TABLE OF
POTENTIAL IMPACTS STAGE 6**

FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
		SC3 + C4 + C12 + CS1 North of Greenwood	S7 + S7/S8 South of Greenwood
NATURAL ENVIRONMENT <i>Ecosystem Integrity</i>	<ul style="list-style-type: none"> Severance of/encroachment on identified upland ecosystems (ha) 	<ul style="list-style-type: none"> Encroaches on large mature remnant woodlot in Lot 8 Con 6 	<ul style="list-style-type: none"> Encroaches on large mature remnant woodlot in Lot 8 Con 6
	<ul style="list-style-type: none"> Severance of/encroachment on identified aquatic ecosystems (ha) 	<ul style="list-style-type: none"> Encroaches on forested area at north end of Heber Down CA Encroaches on coldwater tributaries to Duffins Creek southeast of Brougham Creek, West Lynde Creek systems 	<ul style="list-style-type: none"> Encroaches on forested area at north end of Heber Down CA Severs system of coldwater tributaries to Duffins Creek
	<ul style="list-style-type: none"> Severance of/encroachment on identified wetland ecosystems (ha) 	<ul style="list-style-type: none"> Crosses Duffins Creek, Carruthers Creek, West Lynde Creek systems No impacts identified 	<ul style="list-style-type: none"> No impacts identified

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FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
		SC3 + C4 + C12 + CS1 North of Greenwood	S7 + S7/S8 South of Greenwood
Surface Water Quality and Quantity	<ul style="list-style-type: none"> Watercourse crossings (number) Encroachment on headwater areas (ha) Realignment/channelization required (m) Effects on surface drainage/flood plain (qualitative) 	<ul style="list-style-type: none"> 13, 9 intermittent streams 4 permanent watercourses 106 ha 2530 m Hwy grade opposite to OG slope at SL14 (500m), and Westney Rd (400m). Significant realignment near crossing #68 	<ul style="list-style-type: none"> 11, 7 intermittent streams, 4 permanent watercourses 10 ha 2720 m Hwy grade opposite to OG slope at Westney Rd (350m), Salem Rd (250m), Audley Rd (300m), and RR23 (500m). Significant realignment near crossing #38
	<ul style="list-style-type: none"> Nature/extent of management programs (MOEE, Conservation Authorities) (qualitative) 	<ul style="list-style-type: none"> MTRC Duffins Creek Basin Management Strategy 	<ul style="list-style-type: none"> MTRC Duffins Creek Basin Management Strategy
Fisheries (Aquatic Biology - to be identified in terms of stream crossing number)	<ul style="list-style-type: none"> Warmwater fisheries (number) Coldwater fisheries (number) 	<ul style="list-style-type: none"> No impacts identified 4, Unnamed Ck (#37), Unnamed Creek (#43), Duffins Ck (#46) and West Lynde Ck (#68) 	<ul style="list-style-type: none"> 1, Duffins Ck (#48) 3, Unnamed Ck (#39), Unnamed Ck (#45) and West Lynde Ck (#68)
	<ul style="list-style-type: none"> Extent of riparian vegetation removal (m) Altered/displaced habitat/spawning areas (m) 	<ul style="list-style-type: none"> 595 m, grasses, small shrubs, few trees, agricultural hedgerow, dense mature forest 1041 m, low to moderate coldwater fish habitat, 1 small spawning area 	<ul style="list-style-type: none"> 910 m, dense forest, cedar thicket, deciduous brush 2300 m, moderate cold water habitat, may alter spawning areas

FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
		SC3 + C4 + C12 + CS1 North of Greenwood	S7 + S7/S8 South of Greenwood
<i>Fisheries (Aquatic Biology)</i> <i>contd</i>	● Effects on recreational, rare/endangered/threatened species (number/qualitative)	● 4, 1 regionally rare (Stonecat), 2 recreational species (Brook, Brown Trout), 1 nationally vulnerable, (Redside Dace)	● 5, 1 regionally rare (Stonecat), 3 recreational species (Brook, Brown, Rainbow, 1 nationally vulnerable (Redside Dace)
	● Migratory runs affected (number)	● 2, salmonid runs (#46) (#68)	● 2, salmonid runs (#48) (#68)
	● Nature/extent of habitat rehabilitation programs (MNR, Conservation Authorities) (qualitative)	● MTRC Riparian Protection and Enhancement Plan, MTRC Duffins Creek Basin Management Strategy and bank stabilization	● MTRC Duffins Creek Basin Management Strategy, OMNR Stream Rehabilitation
	● Identified upwelling and seepage areas (number/qualitative)	● 3, 1 high, 2 moderately high	● 3 high

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FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
		SC3 + C4 + C12 + CS1 North of Greenwood	S7 + S7/S8 South of Greenwood
<i>Vegetation (Terrestrial Biology - to be identified in terms of Vegetation Units)</i>	<ul style="list-style-type: none"> Degree of access to/encroachment on/severance of identified Environmentally Significant Areas (ESA's) and/or Areas of Natural and Scientific Interest (Life and Earth Science ANSI's) (ha) 	<ul style="list-style-type: none"> Unit 32: 3 ha encroachment on Heber Down Conservation Area 	<ul style="list-style-type: none"> Units 31 (3.6 ha), 32 (1.5 ha): 5.1 ha encroachment on areas within Heber Down Conservation Area
	<ul style="list-style-type: none"> Effects on unique or rare herbaceous species or communities (type) 	<ul style="list-style-type: none"> Unit 53: Richweed, previously nationally and provincially rare 	<ul style="list-style-type: none"> Unit 38: Richweed, previously nationally and provincially rare
	<ul style="list-style-type: none"> Degree of encroachment on/severance of woodlots/forest areas (ha displaced/total ha (if available)) 	<ul style="list-style-type: none"> Units 32 (3 ha), 49 (7 ha/7), 51 (0.9 ha/7), 52 (2.4 ha/10), 54 (1.8 ha/2), 55 (2 ha/3): 17.1 ha including lowland woods with large willows and poplars, scrub woodland with white birch, elm, hawthorn, sugar maple woodlands 	<ul style="list-style-type: none"> Units 33 (18 ha/18), 39 (0.15 ha): 18.2 ha including early successional woods and pine/spruce plantation, mature sugar maple forest
	<ul style="list-style-type: none"> Nature/extent of forest management/research programs (WIA, plantation, ASA, research plots) (qualitative) 	<ul style="list-style-type: none"> Minor. Units 53 (0.5 ha), 56 (0.5 ha): 1 ha total encroachment on a 1 ha pine/spruce plantation and a 0.5 ha strip pine/spruce plantation along east edge of Duffins Ck corridor. 	<ul style="list-style-type: none"> Minor. Units 33 (4 ha), 42 (2 ha), 43 (2 ha): 8 ha encroachments respectively on 4 ha, 11 ha, and 6 ha conifer plantations

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FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
Wildlife	● Effects on wildlife species (qualitative)	SC3 + C4 + C12 + CS1 North of Greenwood	S7 + S7/S8 South of Greenwood
	● Effects on rare/endangered wildlife species (number/qualitative)	● Moderate. Route segment generally involves removal of mature upland hardwoods, successional forest, old field/scrub woodland, and some lowland forest important for local deer populations. Removal of man-made pond and adjacent wet area in Unit 55 impacts local mammals, waterfowl and amphibians. Much of habitat is isolated, however, and of moderate local value.	● Moderate. Mature upland forest adjacent to successional woods, and some lowland forest with neighbouring old field/scrub woodland are of moderate value to local deer and small game populations. Habitat areas encountered by this route segment are predominately along Carruthers Ck drainage courses and are isolated, supporting local movements of low deer and small game populations only.
	● Displaced wildlife habitat (ha displaced/total ha (if available))	● Units 32 (3 ha), 48 (1 ha/1), 49 (7 ha/7), 50 (3 ha/8), 52 (2.4 ha/10), 53 (6.8 ha), 54 (1.8 ha/2), 55 (2 ha/3), 56 (1 ha/1), 59 (1 ha/2), 60 (2 ha/13): 31 ha	● Units 31 (1.5 ha), 33 (18 ha/18), 34 (3 ha/7), 35 (3.6 ha/13): 26.1 ha
	● Barrier effects on travel corridors (qualitative)	● Moderate overall. Significant corridor along Duffins Ck wetland forest and some corridor value within Carruthers Ck watershed. Other areas of habitat exhibit local movements only.	● Moderate overall. High corridor value along Duffins Ck with its diverse habitat and some corridor value within the Carruthers Ck watershed. Other areas of habitat exhibit local movements only.

FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
		SC3 + C4 + C12 + CS1 North of Greenwood	S7 + S7/S8 South of Greenwood
<i>Hydrogeology</i>	● Effect on groundwater resource areas (high water table, recharge areas, significant overburden aquifers) (ha)	● 47 ha, 94 ha, 7 ha	● 63 ha, 57 ha, 50 ha
	● Private/municipal shallow/deep wells within 150 m of ROW (number)	● 3 wells, 2 drilled, 1 deep bored	● 6 wells, 3 shallow, 2 drilled, 1 deep bored
	● Encroachment on abandoned/existing waste sites (number)	● No impacts identified	● No impacts identified
SOCIAL ENVIRONMENT <i>Communities</i>	● Encroachment on/severance of established and proposed settlement areas (qualitative)	● Link severs Seaton Lands south of Brougham	● Minor encroachment on south part of Greenwood expansion envelop, severs Seaton Lands south of Brougham
	● Influence in defining settlement areas (qualitative)	● Moderate influence, defines northern limit of Kinsale, potential to encourage expansion of Greenwood north of Hwy 7	● High influential in defining southerly limit of Greenwood
	● Residences displaced (number)	● 17	● 14
	● Access to/displacement of community facilities (major institutional uses) (qualitative)	● Link traverses Swiss Chalet Park, slight encroachment on north fringe of Heber Down Conservation Area	● Traverses Open Space Area south of Greenwood, minor encroachment on north fringe of Heber Down Conservation Area
	● Delivery of community services (emergency, school bus) (qualitative)	● Low. 33 routes disrupted	● Low. 27 routes disrupted
	● Inter-urban and rural-urban barrier effects (qualitative)	● No impacts identified	● No impacts identified

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FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
		SC3 + C4 + C12 + CS1 North of Greenwood	S7 + S7/S8 South of Greenwood
<i>Recreation</i>	<ul style="list-style-type: none"> Access to/displacement of recreational uses (qualitative) 	<ul style="list-style-type: none"> Encroaches on approximately 40% of existing Swiss Chalet Park lands 	<ul style="list-style-type: none"> Cuts through centre of designated Open Space Area south of Greenwood
<i>Visual Aesthetics (View from the facility)</i>	<ul style="list-style-type: none"> Total aesthetic value of visibly accessible landscape components (qualitative/scenic value) 	<ul style="list-style-type: none"> Rolling hills, Duffins Creek valley create attractive landscape (+4) 	<ul style="list-style-type: none"> Aesthetic vegetation, abandoned quarries and Hydro corridor (+2)
	<ul style="list-style-type: none"> Total scenic value based on composition, arrangement and sequence of landscape components (qualitative/scenic value) Total potential visual impact on sensitive viewer groups based on sensitivity, proximity and frequency of viewer groups (qualitative/scenic value) 	<ul style="list-style-type: none"> Scenic views of large valley to east, curves and elevated topography provide long vistas to south (+4) Sparsely populated, Brougham to the northwest 	<ul style="list-style-type: none"> Good variety of landscape types with potential, long views from tangent (+2) Concentration of dwellings near Greenwood (-2)
<i>Noise</i>	<ul style="list-style-type: none"> Noise sensitive receivers experiencing changes (+/-) in sound levels (5 dB intervals) over pre-existing conditions (number) 	<ul style="list-style-type: none"> 29 residences impacted, 6 (5-10 db), 23 (10-15 db) 	<ul style="list-style-type: none"> 40 residences impacted, 36 (5-10 db), 3 (15-20 db), 1 > (20 db)
	<ul style="list-style-type: none"> Noise sensitive receivers experiencing resultant absolute noise level over 55 db) (number) 	<ul style="list-style-type: none"> 11 residences impacted, 6 (55-60) db, 5 (60-65 db) 	<ul style="list-style-type: none"> 12 residences impacted, 3 (55-60 db), 7 (60-65 db), 2 (65-70 db)

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FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
		SC3 + C4 + C12 + CS1 North of Greenwood	S7 + S7/S8 South of Greenwood
ECONOMIC ENVIRONMENT <i>Provincial/Municipal/Private Land Use Development Strategies</i>	<ul style="list-style-type: none"> Degree of compatibility with municipal development goals/objectives (high/moderate/low) 	<ul style="list-style-type: none"> Moderate, not fully compatible with Durham/Pickering land use objectives (407 in Concession 5; rural, agricultural, major open space uses in Concession 6) and Whitby's desire to locate 407 further from Macedonian Village, Heber Down Conservation Area, and former waste site 	<ul style="list-style-type: none"> Moderate, not fully compatible Pickering's land use objectives. Incompatible with Whitby's desire to locate 407 further from Macedonian Village, Heber Down Conservation Area, and former waste site
	<ul style="list-style-type: none"> Capability to provide transportation service/stimulate development of major development initiatives (Seaton, Pickering Airport) (high/moderate/low) 	<ul style="list-style-type: none"> Not applicable 	<ul style="list-style-type: none"> Not applicable
	<ul style="list-style-type: none"> Compatibility with Provincial/Federal planning goals/objectives/policies (high/moderate/low) 	<ul style="list-style-type: none"> Moderate, minimizes impacts to linear greenland corridors (Duffins Creek) but not fully compatible with preservation of West Lynde Creek and Heber Down CA 	<ul style="list-style-type: none"> Moderate, minimizes impacts to linear greenland corridor (Duffins Creek) but is particularly incompatible with Master Plan for Heber Down CA.
	<ul style="list-style-type: none"> Constraints/opportunities for designated settlement area expansion (qualitative) 	<ul style="list-style-type: none"> Opportunity for modest easterly expansion of Brougham. No significant influence at Greenwood (existing Highway 7 may be retained as north limit). Highly compatible with Town of Pickering desire to limit northerly expansion of Kinsale 	<ul style="list-style-type: none"> Constrains southerly expansion of Greenwood. Opportunity for southern expansion of Kinsale
	<ul style="list-style-type: none"> Population/employment redistribution effects (qualitative) 	<ul style="list-style-type: none"> Potential to create employment node north of Greenwood at Westney Road I/C north of Hwy 7 	<ul style="list-style-type: none"> No impacts identified
	<ul style="list-style-type: none"> Effects on approved private 	<ul style="list-style-type: none"> Severs Green-way recycling site 	<ul style="list-style-type: none"> Severs Fourteen Estates proposal

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FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
		SC3 + C4 + C12 + CS1 North of Greenwood	S7 + S7/S8 South of Greenwood
<i>Non-Farm Commercial Activities</i>	• Businesses displaced (number)	• 1 business	• No impacts identified
	• Employees displaced (number)	• 5	• No impacts identified
	• Changes (+/-) in business exposure (qualitative)	• Moderate, reduction in regional traffic for businesses along Hwy 7, increased exposure along Westney Road north of Greenwood north of Hwy 7	• Moderate, reduction in regional traffic for businesses along Hwy 7, increased exposure along Westney Road south of Greenwood
	• Changes in site access/internal circulation (qualitative)	• No impacts identified	• No impacts identified
AGRICULTURE <i>Physical Resource Consumption</i>	• Loss of Class 1 and Class 2 land (ha)	• 252.0 ha, predominantly Class 1, with topography limitations, organic soils at Duffins Creek	• 234.30 ha, predominantly Class 1, with topographic/moisture limitations where Duffins Creek tributaries run southwest of Greenwood
	• Loss of Class 3 and Class 4 land (ha)	• No impacts identified	• No impacts identified
	• Total farm property required (ha)	• 28.1 ha	• 19.8 ha
<i>Facility Resource Consumption</i>	• Farm buildings/structures displaced (number/quality)	• 14, 2 houses, 12 barns/sheds. All in fair to good condition	• 1 house (tenant occupied on Metro Toronto land)
	• Specialty crop (rootstocks) displaced (type/ ha)	• 23.2 ha, nursery tree stock, orchard	• No impacts identified
	• Total owned land required (ha)	• 75.7 ha	• 62.4 ha
	• Improved land required (ha)	• 0.5 ha (tile drain, Lot 7 Con 6)	• No impacts identified

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FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
		SC3 + C4 + C12 + CS1 North of Greenwood	S7 + S7/S8 South of Greenwood
<i>Farm Operation Impacts</i>	<ul style="list-style-type: none"> • Total farm properties directly affected (number) • Livestock operations (field/facility) affected (number/type) • Specialty operations affected (number/type) 	<ul style="list-style-type: none"> • 13, 4 cash crop, 2 nursery, 4 beef, 1 sheep, 1 dairy, 1 orchard. • 6, 4 beef, 1 sheep, 1 dairy • 3, 2 nurseries, 1 orchard. Dutchmaster nursery and Motillaro orchard (Lot 6) encroachment only. Kerven Nursery (Lot 35 Whitby) displaced but only small area is nursery 	<ul style="list-style-type: none"> • 7, 2 cash crop, 1 cash crop/beef, 1 horse, 3 beef. • 4, 1 horse, 3 beef • No impacts identified
	<ul style="list-style-type: none"> • Farm properties > 20 ha affected (number) 	<ul style="list-style-type: none"> • 11 properties 	<ul style="list-style-type: none"> • 5 properties
	<ul style="list-style-type: none"> • Severed parcels > 20 ha (number) 	<ul style="list-style-type: none"> • 6 parcels 	<ul style="list-style-type: none"> • 5 parcels
	<ul style="list-style-type: none"> • Severed parcels < 20 ha (number) 	<ul style="list-style-type: none"> • 10 parcels 	<ul style="list-style-type: none"> • 6 parcels
	<ul style="list-style-type: none"> • Intra-property movement patterns affected (number) 	<ul style="list-style-type: none"> • 10, 1 landlocked 	<ul style="list-style-type: none"> • 4
<i>Area Operation Impacts</i>	<ul style="list-style-type: none"> • Transportation routes affected (number) 	<ul style="list-style-type: none"> • 12, Hwy 7, Sidelines 16, 14, & 4, Brock, Paddock, Westney, Salem, Audley, Halls, Coronation Roads and Durham Road 23. Realignment of Sideline 16 	<ul style="list-style-type: none"> • 12, Sidelines 16, 14, & 8, Sideroad 4, Brock, Greenwood, Westney, Salem, Kinsale, Halls, Coronation Roads and Durham Road 23
	<ul style="list-style-type: none"> • Division of agricultural community areas (number) 	<ul style="list-style-type: none"> • Some separation of agricultural hinterland from Greenwood 	<ul style="list-style-type: none"> • Some separation of agricultural hinterland from Greenwood

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FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
		SC3 + C4 + C12 + CS1 North of Greenwood	S7 + S7/S8 South of Greenwood
CULTURAL ENVIRONMENT <i>Historical Resources</i>	<ul style="list-style-type: none"> Features within 100 m of ROW (exceptional/moderate/ordinary) Features within ROW (exceptional/moderate/ordinary) 	<ul style="list-style-type: none"> 7, 2 excellent residences, 1 moderate residence, 1 ordinary residence, 1 excellent school, 1 ordinary farm, 1 moderate farm 6, 4 exceptional residences (Milroy, Atkins, Young, Burtondale), 1 ordinary residence, 1 moderate farm 	<ul style="list-style-type: none"> 6, 1 excellent residence, 1 excellent religious building, 2 ordinary residences, 2 ordinary farms 2, 1 excellent residence (Dolman, Greenwood Road), 1 excellent cemetery (Salem Cemetery)
<i>Cultural Landscape</i>	<ul style="list-style-type: none"> Degree of disruption to landscape units (major/moderate/minor) 	<ul style="list-style-type: none"> High, Duffins Creek visually sensitive area, moderate, close to historical settlement of Kinsale, cuts across Duffins Ck valley wall 	<ul style="list-style-type: none"> Moderate, cuts across Hwy 7 corridor and part of Duffins Creek Valley wall, close to historical hamlets of Greenwood and Kinsale
<i>Archaeological Resources</i>	<ul style="list-style-type: none"> Registered sites within ROW (number/type) 	<ul style="list-style-type: none"> 1 site, Salgo Site (AIGs-27, Archaic campsite, significant) 	<ul style="list-style-type: none"> 1 site, Salgo Site (AIGs-27, Archaic campsite, significant)
	<ul style="list-style-type: none"> Potentially significant sites/resource areas affected (number/type) 	<ul style="list-style-type: none"> Encroaches on historically recorded pine stand 	<ul style="list-style-type: none"> 1 site, Waltham Site (AIGs-9, Iroquoian Village, significant). Encroaches on historically recorded pine stand

FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
		SC3 + C4 + C12 + CS1 North of Greenwood	S7 + S7/S8 South of Greenwood
TRANSPORTATION AND ENGINEERING <i>Network Configuration and Traffic Service</i>	<ul style="list-style-type: none"> Interchange conditions (qualitative) 	<ul style="list-style-type: none"> Fair. Non-standard. 55° I/C at SL14, watercourse running through Westney I/C. 60° I/C at RR23 	<ul style="list-style-type: none"> Fair/good. Non-standard. Watercourse present at SL 14, cemetery in NE quadrant at Salem I/C, greater than 10m cut at Westney I/C. However all can be mitigated.
	<ul style="list-style-type: none"> Degree of compatibility with provincial road system (existing/proposed) (high/moderate/low) 	<ul style="list-style-type: none"> High 	<ul style="list-style-type: none"> High
	<ul style="list-style-type: none"> Degree of compatibility with municipal road system (existing/proposed) (high/moderate/low) 	<ul style="list-style-type: none"> High 	<ul style="list-style-type: none"> Moderate. No road at SL 14, close road leading into C.A., just west of Greenwood
	<ul style="list-style-type: none"> Degree of compatibility with protection for transit objectives (high/moderate/low) 	<ul style="list-style-type: none"> Moderate. High cost, grading differential > 5m at Salem Road 	<ul style="list-style-type: none"> Moderate. High cost, grading differential > 5m at Salem Road and S.L. 4
	<ul style="list-style-type: none"> Degree to which existing/future travel demand is satisfied (Overview Study/traffic modelling) (high/moderate/low) 	<ul style="list-style-type: none"> Moderate. 78% of traffic through residential area 	<ul style="list-style-type: none"> High
Geometrics	<ul style="list-style-type: none"> Horizontal alignment (# of radii, curve lengths / route segment length) (qualitative) 	<ul style="list-style-type: none"> Fair. 5, (2-1500m, 1-3000m, 2-2000m), 4990/9880 	<ul style="list-style-type: none"> Good. 2, (2-2000m), 1240/9500
	<ul style="list-style-type: none"> Vertical alignment (length of fill > 5m/ cut > 5m, noteworthy maximum grades) (qualitative) 	<ul style="list-style-type: none"> Fair. 1530/1600, cut section > 10m for 350m, fill section > 10m for 150m 	<ul style="list-style-type: none"> Poor. 5450m/1900m, cut section > 10m for 800m, fill section > 10m for 200m. Steep grades of 3% for 500m.

APPENDIX 14

Highway 407/Transitway
Markham Road Easterly to Highway 7 East of Brock Road
Environmental Assessment Study

FACTOR	INDICATOR	ROUTE SEGMENT POTENTIAL IMPACTS	
		SC3 + C4 + C12 + CS1 North of Greenwood	S7 + S7/S8 South of Greenwood
<i>Geotechnical</i>	<ul style="list-style-type: none"> Potential engineering/environmental problems due to geotechnical conditions (qualitative) Effects on aggregate resources (primary/secondary) (type/ ha) 	<ul style="list-style-type: none"> Poor foundation conditions at Duffins Creek, 350m of deep soft subgrade 800/250 	<ul style="list-style-type: none"> Poor foundations at Duffins Creek 950/500
	<i>Staging Options</i>	<ul style="list-style-type: none"> High. No problems, best serves south and east demands, temporary connection to Hwy 7 	<ul style="list-style-type: none"> High. No problems, majority of traffic to south
<i>Construction Considerations</i>	<ul style="list-style-type: none"> Major impacts during construction (road/access closures, detours, utilities/rail conflicts) (qualitative) 	<ul style="list-style-type: none"> Crosses hydro corridor - no tower relocations required, detour close to residences on Kinsale. Watercourses through Westney I/C 	<ul style="list-style-type: none"> Crosses hydro corridor - one tower relocation required detour access to residences on Westney. Audley & Halls Roads
	<i>Cost</i>	<ul style="list-style-type: none"> 9880 m 178.6 M \$1.5 M, must raise 2 Hydro towers 11 properties 43 properties \$15.8 M \$194.5 M 	<ul style="list-style-type: none"> 9500 m \$179.8 M \$1.5 M, replace 3 Hydro towers 18 properties 44 properties \$15.1 M \$196.4 M

APPENDIX 14

APPENDIX 15
SUMMARY OF COMPARISON
OF S3 AND S3S

COMPARISON OF LINK S3 AND S3S

INTRODUCTION

Following the selection of the Technically Preferred Route, presentations were made to ministries, agencies, and the public in order to provide information and receive comments and concerns. As a result of the input received and discussions with the Town of Markham, a minor alignment shift was developed to reduce the impact at the Little Rouge Creek crossing and the related investigations were a follow-up on those previously conducted in this area. The new alternative alignment crosses Little Rouge Creek south of the CP Rail structure, approximately 400 m south of Link S3 which formed part of the 1991 Technically Preferred Route.

The following is a detailed outline of the main differences between Link S3 and the new alternative (Link S3S). The description of the differences between the two links for the evaluation indicators are arranged under the following subsections which correspond to the six main factor group headings: Natural Environment, Social Environment, Economic Environment, Agriculture, Cultural Environment, and Transportation and Engineering.

Natural Environment

Ecosystem Integrity

No differentiating impacts were identified.

Surface Water Quality and Quantity

There is no significant difference between the two segments. Both segments cross the same 4 intermittent streams and Little Rouge Creek. The location where Segment S3S crosses one of the Intermittent streams is at the confluence with a smaller stream.

Fisheries (Aquatic Biology)

There is no meaningful difference between the two segments with respect to the 4 intermittent streams. These intermittent streams are warmwater and have a low potential as fish habitat.

The Little Rouge Creek has a coldwater migratory run and is a significant fishery resource. The fish habitat of Little Rouge Creek is considered superior north of the CP railway bridge. Segment S3 crosses the Little Rouge Creek north of the CP railway where the creek is fairly fast flowing and is well shaded by mature deciduous trees. Segment S3S crosses the Little Rouge south of the CP railway where the creek is wider and slower flowing with less shade from mainly cedar trees.

Vegetation (Terrestrial Biology)

There are 3 noteworthy woodlots that are impacted by Segment S3 and/or Segment S3S (Unit 85, Unit 86, and Unit 87).

Unit 85, located southwest of Highway 7 and Durham-York Line, is composed of an isolated conifer plantation with limited wildlife value. Both segments sever this 2 ha woodlot leaving 1 ha remaining.

Unit 87 is located southwest of Highway 7 and the Markham Bypass. This is a very significant woodlot which the Town of Markham would like to protect due to its size, quality and species content/diversity. Segment S3 encroaches on the woodlot and would require approximately 15% of it to be removed. The northern right-of-way limit of Segment S3S is significantly removed from the woodlot.

Unit 86 is located along the Little Rouge Creek and is considered significant in terms of both vegetation and wildlife habitat. Segment S3 crosses this corridor north of the CP railway structure and Segment S3S crosses the corridor south of the CP railway structure. The vegetation quality and area is significantly different at these two crossing points. A site visit was conducted by the Project Team's terrestrial biology specialist (Dr. D. Cameron) May 24, 1992. He concluded that Segment S3S is preferable from a terrestrial ecological perspective for the following reasons:

- a) The southern route would consume 4 ha of stream bank and flood plain vegetation and wildlife habitat, whereas the northern route would consume 7 ha of stream bank, floodplain, and upland forest vegetation and associated wildlife habitat;
- b) The northern route includes a mature upland deciduous forest (sugar maple, hemlock, beech) with a number of large tree specimens;
- c) While both alternatives would affect the wildlife corridor value of the stream bank and flood plain vegetation, the northern route also includes upland vegetation inhabited by a spectrum of age-classes of deer of both sexes; the southern route appears to be used by deer mainly as a travel corridor.
- d) Wildlife habitat value, in general, is higher on the northern route because of a greater variety of contiguous habitats, as well as more absolute area of habitat.

Hydrogeology

No significant differences were identified.

Waste Sites

No sites reported or observed.

Social Environment

Communities

The only significant difference between the two segments is with respect to the indicator 'Residences displaced'. At 10th Line one residence would be displaced with Segment S3 but Segment S3S would displace two different residences. All these properties are owned by ORC.

Recreational

No significant difference. Passive recreation opportunities in the Little Rouge Creek valley.

Visual Aesthetics (View from the facility)

No significant difference.

Visual Aesthetics (View of the facility)

West of Ninth Line there is no significant difference. The highway would be between 20 m and 60 m further away from the residences on Colonel Butler Drive with Segment S3S over Segment S3.

The impact on Locust Hill would be reduced by Segment S3S. With Segment S3 the highway would be about 400 m from residences and is in high fill (i.e., over 8 m) through this section. With Segment S3S the highway would not be closer than 600 m to homes, and the section of high fill would be 850 m from residences.

Noise

West of Ninth Line there is no significant difference. The highway would be between 20 m and 60 m further away from the residences on Colonel Butler Drive with Segment S3S over Segment S3.

The overall impact with respect to noise is expected to be less with Segment S3S due to the fact that the impact on Locust Hill would be reduced (i.e., noise levels attributable to Highway 407 would be reduced approximately 5 dB to 55 - 60 dB Leq). With Segment S3 the highway would be about 400 m from residences and is in high fill (i.e., over 8 m) through this section. With Segment S3S the highway would not be closer than 600 m to homes, and the section of high fill would be 850 m from residences.

This benefit is considered to outweigh the marginal (0 - 5 dB) increases to 5 primarily publicly owned residences on Tenth Line which would be newly affected by Segment S3S.

Economic Environment

Provincial/Municipal/Private Land Use Development Strategies

Segment S3S would be between 100 m and 300 m south of Segment S3 between Ninth Line and the Markham Bypass. This would allow the East Markham (Cornell) Community area to be expanded in the order of 15 to 25 ha.

Non-Farm Commercial Activities

No significant difference.

Agriculture

Physical Resource Consumption

No significant difference.

Facility Resource Consumption

No significant difference.

Farm Operation Impacts

There are differences between the two alternatives for the following indicators. However, all parcels are ORC owned.

Total farm properties directly affected and Farm properties > 20 ha affected

For S3 - 4 - All are ORC owned and leased.
For S3S- 6 - All are ORC owned and leased.

Severed parcels > 20 ha

For S3 - 2 - All are ORC owned and leased.
For S3S- 2 - All are ORC owned and leased.

Severed parcels < 20 ha

For S3 - 6 - All are ORC owned and leased.
For S3S- 7 - All are ORC owned and leased.

Intra-property movement patterns affected

For S3 - 3 parcels landlocked

For S3S - 1 parcel landlocked

Area Operation Impacts

No significant difference.

Cultural Landscape***Built Heritage Features***

The only difference between the two segments is found at 10th Line. For Segment S3, one 19th century farmstead is located within 100 m of the right-of-way. For Segment S3S, one 19th century farmstead is located within the right-of-way and one 19th century farmstead is located within 100 m of the right-of-way. All three properties are categorized as 'ordinary' in terms of historical and architectural significance. This evaluation was verified through visual review and contact with the Heritage Unit of the Town of Markham. It has been noted the residence which falls within the Segment S3S right-of-way does not appear to be well maintained,

Cultural Landscape

Segment S3S has less impact on the historical settlement of Locust Hill.

Archaeological Resources

The difference between the segments occurs between Ninth Line and Durham-York Line. While Segment S3 does not Impact any known archaeological sites, Segment S3S lies adjacent to two significant archaeological sites immediately to the south. These sites are AIGt - 35 (Burkholder II site) and AIGt - 14 (Ken Reesor II Site). AIGt - 35 and AIGt - 14 are both rated as significant (Iroquoian villages or campsites which are 3 to 6 acres in size) which should be avoided or mitigated.

Transportation and Engineering***Network Configuration and Traffic Service*****Interchange Conditions**

There is no significant difference between the two segments for the four interchanges the study is protecting for, namely at Highway 48, Ninth Line, Markham Bypass, and Durham-York Line.

The Town of Markham has requested that the feasibility of an east oriented half diamond interchange at Tenth Line be commented on. (The Ministry is not proposing an interchange at the Tenth Line.) If an east oriented half diamond interchange is constructed at Tenth Line in conjunction with Segment S3, the ramp bullnoses would extend onto the Little Rouge Creek structure adding significantly to the width and cost of the structure over the environmentally sensitive creek. In conjunction with Segment S3S, the ramps bullnoses would extend onto the much smaller CP Rail structure, which would have less impact on the Little Rouge Creek crossing and be less expensive than with S3.

If the road network is constructed as presently proposed in plans for the Cornell Community, a partial east oriented interchange at Tenth Line would be impractical. The Cornell Plan proposes that a north-south arterial cross Highway 407 less than 400 m west of Tenth Line with a full Parclo A-4 interchange. This north-south arterial would angle to the northeast and may replace Tenth Line north of Highway 7. This would leave Tenth Line with a much more local function south of Highway 7 and, therefore, an interchange would not effectively serve traffic demand.

Compatibility with Existing Provincial Road Network

No difference.

Compatibility with Proposed Provincial Road Network

As outlined in correspondence from MTO's Urban and Regional Planning Office (July 20, 1992) a freeway facility north of Highway 7 in the Tenth Line area is not justified based on the most up to date land use forecasts. It was noted that if and when the Federal Airport lands develop, access to that area could be from a facility constructed further to the east. Since no provincial freeway facility will be constructed in the vicinity of Tenth Line, both Alternatives S3 and S3S are equally compatible with the proposed provincial road network.

Compatibility with Existing Municipal Road Network

No difference.

Compatibility with Proposed Municipal Road Network

There is no significant difference with respect to the municipal network as presented with the technically preferred route in the spring of 1991. However, with the municipal network as proposed by the Cornell Plan, Segment S3S is preferable since it gives the north-south arterial more flexibility to be directed in a northeast direction to increase the land area within Cornell.

Compatibility with Protection for Transit Objectives

No difference.

Degree to which Future Travel Demand is Satisfied

No significant difference. Segment S3S is 160 m longer than Segment S3.

Geometrics

Horizontal Geometrics

West of the Markham Bypass there is no significant difference between the alignments of the two segments. Segment S3 has a short 2,000 m radius curve (220 m in length), whereas S3S has a long 9,000 m radius curve (2,075 m in length). The 9,000 m curve extends across the Rouge River structure but is not expected to significantly affect the structure construction since the mid span deflection of the curve is less than 0.6 m.

At the CP railway and the Little Rouge Creek crossing the westerly 2,000 m curve of Segment S3S extends across both the railway structure and the Creek structure which will likely increase their cost in the order of 10%. However, where Segment S3 crosses the Little Rouge Creek there is a significant bend in the creek which will give less flexibility for the placement of piers.

East of Tenth Line, Segment S3S has a better alignment in relation to the proposed Durham-York Line interchange. The length of tangent between the two reverse curves on Segment S3S is 1,250 m, so only the easterly curve influences the Durham-York Line interchange. However, Segment S3 only provides a minimum tangent of approximately 400 m between two reverse curves, 2,000 m in radius, through the interchange area.

If the municipal road network proposed for Cornell is adopted, the above comments are still valid since the north-south arterial would interchange with Highway 407 on the tangent section similar to the Markham Bypass.

Vertical Alignment

The vertical alignment is essentially the same for the two alternative segments with the exception of the section from the Markham Bypass to Durham-York Line. The difference between the two profiles is caused by the location of the CP railway grade separation in relation to the Little Rouge Creek crossing. The high fill (i.e., greater than 5 m) required for Segment S3 begins at the Little Rouge Creek crossing and extends 940 m to the east and, of that, 590 m is fill over 8 m in height. The high fill for Segment S3S begins immediately east of the Markham Bypass interchange and extends for 780 m to the east and, of that, 450 m is fill over 8 m in height. Segment S3 requires approximately 100,000 m³ of fill in addition to that required for Segment S3S. The heights of the bridge structure over the Little Rouge Creek are 13.5 m and 17.5 m for Segment S3 and S3S respectively.

Although the vertical alignments for the two segments are significantly different at Little Rouge Creek, neither profile is significantly less desirable than the other.

*Geotechnical*Potential engineering / environmental problems

No difference based on the level of design/investigations to date.

Effects on aggregate resources (primary/secondary)

No difference.

*Staging Options*Ease of construction staging

No difference.

*Construction Considerations*Major impacts during construction

No difference.

*Cost*Length

Over the 6.5 km length from Markham Road to just east of Durham-York Line, Segment S3S is only 150 m longer than Segment S3. This is considered an Insignificant difference.

Construction cost

The only significant cost differences between the two segments are related to the Little Rouge Creek structure and approach fill and the difference in length between the segments.

S3

Little Rouge Creek. structure (total length 210 m)	\$ 17.6 million
Additional 100,000 m ³ fill required	\$ <u>0.5 million</u>
	\$ 18.1 million

S3S

Little Rouge Creek. structure (total length 190 m)	\$ 16.0 million
10% premium for structure on 2,000 m curve	\$ 1.6 million
Additional Highway length 160 m	\$ <u>0.9 million</u>
	\$ 18.5 million

The cost difference of \$400,000 is not considered significant, given the overall costs for the project.

Relocation cost

No difference.

Public property affected

The number of properties affected is given for the section where there is a meaningful difference between the alternative segments, namely from Ninth Line to Durham-York Line. Within this section Segment S3 affects 12 provincially owned properties and Segment S3S affects 14. All properties are under single ownership (ORC).

Private property affected

The number of properties affected is given for the section where there is a meaningful difference between the alternative segments, namely from Ninth Line to Durham-York Line. Within this section Segment S3 and Segment S3S both affect 2 private properties. However, Segment S3S has a much greater impact on the undeveloped Toronto Catholic Cemetery Association property. Segment S3S requires 12.2 ha of land (based on no basket weave structures) from the 72 ha property, whereas Segment S3 only requires 0.3 ha.

Property cost

Both segments have the same overall land requirements and it is expected that the property costs would not be significantly different.

Total cost (construction, relocation and property)

There is no significant cost difference between the two alternative segments.

Basket Weave Ramps from Ninth Line to Markham Bypass

In the process of developing Segment S3S, a basket weave design was developed to ensure adequate weaving distances were maintained between Ninth Line and the Markham Bypass while maintaining the full 120 km/h design speed for the freeway ramp entrances/exits. A similar basket weave structure would be required for Segment S3 to maintain the same standards.

The basket weave design for Segment S3S requires additional land and has the following additional impacts above that of Segment S3S without the basket weave design for the ramps:

Note: Need for basket weaves is based on the north-south arterial location which will be determined by others.

Natural Environment

The basket weave design would bring the interchange right-of-way to within 20 m of the woodlot located southwest of Highway 7 and the Markham Bypass (Unit 87). Without the basket weave the interchange right-of-way would be approximately 120 m from the woodlot.

Social Environment

No significant difference with basket weaves.

Economic Environment

It was noted under the factor "Provincial / Municipal / Private Land Use Development Strategies" that Segment S3S would allow the Cornell Community to be expanded in the order of 25 ha above that of Segment S3. This would be reduced to 15 ha with the basket weave ramps.

Agriculture

An additional 11.2 ha of farmland would be required to incorporate the basket weave ramps. This would not change the Farm Operations impact as far as number of farms affected and the number of severances created.

Cultural Landscape

Under the factor "Archaeological Resources" it was noted that Site AIGt - 35 (Burkholder Site II - Iroquoian Village) would be immediately adjacent to the south right-of-way boundary of Segment S3S. With the addition of the basket weave ramps Site AIGt - 35 would fall within the right-of-way.

Transportation and Engineering

Three items are affected under this factor group:

- Public property affected

It was noted that, without the basket weave ramps, Segment S3S would affect 14 provincially owned properties. With the basket weave ramps, one more ORC property would be affected.

- Private property affected

Without basket weave ramps, Segment S3S would require 12.2 ha of land from the undeveloped Toronto Catholic Cemetery Association property. This land requirement would be increased to 24 ha with the basket weave structures.

- Cost

The construction of the basket weave ramps would add significantly to the cost.

From the above, it was concluded that if the basket weave ramps are added to Segment S3S they will not compromise the basis of the overall evaluation since there are not enough significant additional impacts that would favour Segment S3. Also, as indicated at the outset of this section, if the same standards were applied to Segment S3, it too would require basket weave ramps.

Rationale for Refinement of the Technically Preferred Route

The technically preferred route was subsequently modified to include Link S3S in place of Link S3. With regard to the preceding discussion and foregoing subsection 5.5.6, the main attributes which benefit the overall Technically Preferred Route as a whole, with no overall disbenefit, include:

- The route crosses Little Rouge Creek at the most desirable point in this area; and
- The route allows for greater land availability for the Cornell Community.

APPENDIX 16
SUMMARY OF COMMENTS

MINISTRY/AGENCY CONTACT	INPUT/COMMENTS	PROJECT TEAM RESPONSE/ACTION
<p>FEDERAL GOVERNMENT</p> <p>ENVIRONMENT CANADA (DOE)*</p>	<p>Advised that technical liaison will be determined to meet the major anticipated federal interest on a case by case basis (June 1989).</p> <p>Identified issues related to natural environment from review of Technical Papers for Eastern Study Area (Whitby/Oshawa Boundary to Highway 35/115) (January 6, 1992 response to October 11, 1991 information package for entire project provided by MTO).</p> <p>In response to March 1992 follow up, advised that DOE had reviewed material and had no further concerns with or comments on the Technically Preferred Route (April 8, 1992).</p> <p>Advised that DOE had no concerns with the proposed minor alignment shift in the Town of Markham (Link S3S)(October 13, 1992).</p> <p>Requested that the study address issues relating to water quantity and quality, wildlife, and mitigation and enhancement issues (February 15, 1996).</p>	<p>Fenco followed up to request response to Western Study Area package (March 27, 1992).</p>

* Indicates need for continued liaison at technical level

*Highway 407/Transitway
Markham Road Easterly to Highway 7 East of Brock Road*

APPENDIX 16 **SUMMARY OF INPUT/COMMENTS RECEIVED FROM EXTERNAL TEAM**

MINISTRY/AGENCY CONTACT	INPUT/COMMENTS	PROJECT TEAM RESPONSE/ACTION
ENVIRONMENT CANADA (DOE)* (Cont'd)	<p>Follow-up to Meeting. Provided clarification of DOE's request for soil and groundwater monitoring (April 2, 1996).</p> <p>Consultation process will adequately involve DOE in its role as a Federal Authority in the review of the project. Expect that the proponent will attempt to mitigate any potentially significant environmental effects of project.</p> <p>Consideration should be given in the design of stormwater management facilities to allow for easy containment of accidental spills. (August 27, 1996)</p>	<p>Advisory meeting held January 25, 1996 to present information on Hwy 407 Feasibility Study.</p> <p>Meeting held March 13, 1996 to discuss issues and present study objectives to address DOE concerns.</p> <p>Responded to April 2, 1996 letter, providing Stakeholder Consultation Process, and committing to involving DOE in development of Stormwater Management Plan. Not prepared to commit to monitoring of stormwater management facilities at this time. Will reassess when stormwater management program is developed (June 20, 1996).</p> <p>Responded to August 27, 1996 letter advising that MTO will attempt to mitigate potentially significant environmental effects and that opportunities for providing easy containment of spills as part of SWM will be considered (August 29, 1996).</p>

Highway 407/404 Interchange/407 continued liaison at technical level 15Y

Markham Road Easterly to Highway 7 East of Brock Road

APPENDIX 16 SUMMARY OF INPUT/COMMENTS RECEIVED FROM EXTERNAL TEAM

MINISTRY/AGENCY CONTACT	INPUT/COMMENTS	PROJECT TEAM RESPONSE/ACTION
<p>FISHERIES AND OCEAN CANADA*</p> <p>Includes Fisheries and Habitat Management (F&HM) & Canadian Coast Guard (CCG)</p>	<p>Outlined requirements of federal Fisheries Act and protection guidelines, as well as Environmental Assessment Review Process (November 1, 1991).</p> <p>Responded positively to proposed alignment shift in the Town of Markham (SSS) due to reduced impacts to fish habitat (October 14, 1992).</p> <p>CCG advised that only the Rouge River is considered navigable for the purposes of the Navigable Waters Protection Act. Crossing will trigger CEAA (April 30, 1996).</p> <p>Follow-up to March 13, 1996 meeting. Advised that DFO will involved in review of Rouge Crossing and that Coast Guard would be lead RA for CEAA. Fisheries and Habitat Mgmt would be lead RA for any Fisheries Act authorizations. Indicated that spans are desirable in upwelling areas. Consideration should be given to runoff quality and quantity and thermal impacts on watercourses. (April 15, 1996).</p>	<p>Project Team incorporated guidelines in approach to fisheries habitat protection. Note changes to EARP with introduction of Canadian Environmental Assessment Act.</p> <p>MTO confirmed that DFO requires further active involvement, including being copied on Ontario Ministry of Natural Resources (MNR) correspondence. Agreed, that MNR will remain the primary contact until such time as they request DFO involvement related to details on impacts to habitat (i.e. harmful alteration) and possible compensation. DFO is aware of stand alone fisheries studies for the project and MNR's involvement (February 18, 1992).</p> <p>Introductory meeting January 25, 1996. Provided information on 27 potential watercrossings and requested confirmation of what rivers are navigable (January 30, 1996).</p> <p>March 13, 1996 meeting held to review study objectives to address DFO concerns.</p> <p>Stakeholder Consultation Process and objectives provided, confirming the objectives of avoiding in-water structures, alteration and infilling of watercourses, and interference with navigation where bridges are proposed. Also committed to addressing stormwater quantity and quality issues as part of stormwater management program (June 20, 1996).</p>

* Indicates need for continued liaison at technical level

*Highway 407/Transitway
Markham Road Easterly to Highway 7 East of Brock Road*

APPENDIX 16 **SUMMARY OF INPUT/COMMENTS RECEIVED FROM EXTERNAL TEAM**

MINISTRY/AGENCY CONTACT	INPUT/COMMENTS	PROJECT TEAM RESPONSE/ACTION
FISHERIES AND OCEAN CANADA* (cont'd)	<p>F&HM comments on Draft Stakeholder Consultation Process: (July 29, 1996)</p> <ul style="list-style-type: none"> - ongoing consultation will help to foresee information requirements for DFO review - impact to environment must be mitigated to greatest extent possible - monitoring will be required for crossing where Fisheries Act authorization required - advised on Fisheries Act and CEAA process. <p>CCG requested a strong commitment to undertake all mitigation measures developed during CEAA review. CEAA review will not likely be a "Comprehensive Study" (October 2, 1996)</p>	CEAA application and screening is part of design phase.
INDIAN & NORTHERN AFFAIRS CANADA	Cursory review indicates that this project does not appear to impact the department's mandate. Therefore, will not be participating in consultation process or any subsequent environmental assessment review (January 13, 1992, January 19, 1996)	Removed from contact list.
CANADIAN TRANSPORTATION AGENCY (CTA)* (Previously the National Transportation Agency - NTA)	<p>Provided content requirements for CEAA Screening Document relating to railway crossings requiring NTA authorization (January 18, 1996).</p> <p>Clarified changes to Canadian Transportation Act and that the CTA approval and CEAA screening is only required if agreement cannot be reached with the railway company. If CEAA screening is required then CTA will be the Lead Responsible Authority for the screening of the railway crossing. (Sept. 24/96)</p> <p>CPR provided property boundary plans (Sept. 27, 1996)</p>	<p>Provided Draft Stakeholder Consultation process and NTA Flow Chart for review and comment (June 20, 1996).</p> <p>Crossing will be negotiated with CPR during the design phase.</p>

* Indicates need for continued liaison at technical level

Highway 407/Transitway
Markham Road Easterly to Highway 7 East of Brock Road

APPENDIX 16 SUMMARY OF INPUT/COMMENTS RECEIVED FROM EXTERNAL TEAM

MINISTRY/AGENCY CONTACT	INPUT/COMMENTS	PROJECT TEAM RESPONSE/ACTION
PUBLIC WORKS/GOVERNMENT SERVICES CANADA* (Formerly PUBLIC WORKS CANADA)	Generally provided input verbally at External Team meetings or through Transport Canada regarding their role as owner of Pickering Lands. Refer also to Transport Canada.	Fenco sent follow up requests to February 1990 (Route Alternatives) and August 1991 (Technically Preferred Route) information packages but received no responses. All future contacts made through Transport Canada.
TRANSPORT CANADA* (DOT)	No response to February 1990 (Route Alternatives) package. Indicated that there will likely be "core area" and "surplus area" with respect to air transportation purposes on Pickering Lands. Advised that Federal Government intends to protect all of its holdings pending outcome of Southern Ontario Area Airports Study (SDAAS) and federal environmental review process related to Pearson International Airport.	Central Region Director requested response to proposed Route Alternatives (May 1990). Project Team incorporated comments into analysis and evaluation of Route Alternatives.

* Indicates need for continued liaison at technical level

*Highway 407/Transitway
Markham Road Easterly to Highway 7 East of Brock Road*

APPENDIX 16 SUMMARY OF INPUT/COMMENTS RECEIVED FROM EXTERNAL TEAM

MINISTRY/AGENCY CONTACT	INPUT/COMMENTS	PROJECT TEAM RESPONSE/ACTION
<p>TRANSPORT CANADA* (DOT) (Cont'd)</p>	<p>Comments on Route Alternatives included:</p> <ul style="list-style-type: none"> Routes C2 and SC2 not acceptable since they would conflict with airport development. Route S5/S6 avoids Pickering Lands but have concern over ability to provide access to site. Request dedicated airport access, perhaps by additional or specially designed interchange in Brock Road area. Route C9 preferred but would require dedicated access to airport site. <p>Preference of C9 not a commitment of the Federal Government (June 26, 1990).</p> <p>Have no objections or further comments on Technically Preferred Route; keep informed (August 28, 1991).</p> <p>Provided information on Pickering Lands declared surplus (including map) and advised that remainder will be retained for residential, agricultural and commercial uses pending a decision on the airport site. Government agencies will be consulted regarding a land disposal strategy for surplus lands after Ministerial approval received (August 28, 1992). Provided "Pickering Surplus Lands Initial Assessment EARP Draft Phase 1A Report" to MT0 for comment (June 1993).</p> <p>Provided plan showing boundary of airport lands. Verbally advised that Transport Canada is opposed to use of airport lands for Hwy 407, has no objection to technically preferred route, and want to be kept informed of the study progress (January 31, 1996)</p>	<p>Advised Transport Canada that Technically Preferred Route does not appear to affect surplus lands except for southeast corner at Highway 7 and Sideline 18. Preliminary design will determine. Identified implications of IWA Site EE4 selected for Durham Region Landfill (i.e. TPR severs EE4 and alternatives for 407 corridor are situated north of EE4 and Highway 7 on federal lands) (September 2, 1992).</p> <p>Requested that surplus lands not be disposed of until IWA site is selected and feasibility of "Western Access" to airport site can be confirmed. Advised that no protection for major facilities has occurred on east or west side of federal holdings due to uncertainties regarding future land uses. Emphasized that uncertainties resulted in exclusion of potential traffic to and from airport lands from traffic demand forecasts, making determination of required transportation infrastructure difficult (March 9, 1993).</p> <p>MT0, as member of Technical Review Committee for Pickering Lands transportation and land use studies, reiterated need for further information on whether an airport will be developed on Pickering Lands (July 14, 1993).</p> <p>Involve during design phase.</p>

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<p>AGRICULTURE, FOOD AND RURAL AFFAIRS* (Formerly AGRICULTURE AND FOOD)</p>	<p>Provided copy of Agricultural Assessment Requirements for Major Projects (December 20, 1989).</p> <p>Provided initial comments on April 1990 Technical Paper #3 (Agriculture) and Evaluation Criteria (December 27, 1990):</p> <ul style="list-style-type: none"> Information in Technical Paper is thorough and accurate. Evaluation Criteria should include: <u>measure of capital investment; measure of "Owned vs. Rented Lands"</u> and "Full Time vs. Part Time" farming; fragmentation of farms; impact on growth patterns. <p>Provided response to proposed minor alignment shift in Markham (Link S3S), advising they have no objections. Committed to response on remainder of TPR by November 10, 1992. Provided additional comments on Technical Paper #3 (Agriculture) and Technically Preferred Route for entire (Eastern and Western) study area (November 6, 1992).</p> <p>Provided additional comments and concerns on Link S3S based on establishment of Duffin-Rouge Agricultural Preserve between Little Rouge Creek and West Duffin Creek in January 1993. Concern that insufficient weighting had been given to Agriculture in this area (February 25, 1993).</p> <p>Agricultural representatives for Durham Region provided inventory of farming enterprises (by type) and commented positively on assessment of significance of agricultural operations in study area (working meetings). Land Use Specialist provided input through District Manager, Eastern Ontario.</p>	<p>Incorporated in initial Evaluation Criteria and assessment procedure.</p> <p>Measures of indicators have been included to the greatest degree practical. Real estate appraisal of each operation at Route Planning stage not practical.</p> <p>Confidentiality of census information is a limiting factor. Impact on growth patterns has been included in consideration of "compatibility with municipal goals and objectives" (February 13, 1991).</p> <p>Provided, with August 1991 information package on Technically Preferred Route, a summary of how OMAF concerns and information requirements were addressed in the route analysis and evaluation process (August 23, 1991):</p> <ul style="list-style-type: none"> commitment to more detailed assessment of agricultural factors and indicators during Preliminary Design Phase (including mitigation of potential adverse effects) cited transitional nature of agriculture in some portions of the study area, as reinforced by new Region of Durham Official Plan. <p>Followed up August 1991 request for response to TPR in October 1992.</p> <p>Provided response on S3S comments indicating that extent of Agricultural Preserve affected is relatively small (50 ha) and that the differences between the two route segments compared are nominal with respect to the lengths within the Preserve (March 17, 1993).</p>

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AGRICULTURE, FOOD AND RURAL AFFAIRS* (Cont'd)	<p>OMAFRA would have no objection to a request for an exemption from the environmental assessment process for that portion of the study area between Highway 48 and Brock Road as long as the only considered alignment is the technically preferred route of proposed Highway 407 (January 31, 1996).</p> <p>Advised of new contact for purposes of EA review (October 31, 1996)</p>	<p>MTD staff met with OMAFRA (April 20, 1993). Agreed 407 recognized as a major facility crossing the Rouge-Duffin Agricultural Preserve. OMAF to keep MTO advised on related planning activities. Met with OMAF staff to discuss concerns (September 17, 1993) and provided joint response to November 6, 1992 comments through MTO (February 1, 1994).</p>
ONTARIO NATIVE AFFAIRS DIRECTORATE	<p>Proposed study area does not include Indian Reserves or Native Communities and it does not appear that the proposed highway will have any direct impact on Native people - keep informed (July 13, 1989).</p> <p>There are no First Nations in close proximity to, nor are we presently aware of any First Nation land claims brought against Ontario which would affect the proposed project. Therefore it would be appropriate for ONAS to be removed from the project contact list (January 24, 1996).</p>	<p>Maintain contact for pre-submission consultation as requested.</p> <p>Removed from contact list.</p>
COMMUNITY & SOCIAL SERVICES	<p>In response to Study Initiation notice, advised MTO that Ministry has no comments or concerns regarding the project (June 14, 1989).</p> <p>Subsequently, Peterborough Area Office commented that preferred route should facilitate access to Metropolitan Toronto for the planned community of Seaton and to the highway itself for residents of north Whitby and Oshawa (May 22, 1990).</p> <p>No comments or concerns regarding Technically Preferred Route and do not require any further information on the project.</p>	<p>Incorporated comments in analysis and evaluation of route alternatives.</p> <p>Remove from contact list.</p>

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CITIZENSHIP, CULTURE AND RECREATION* (formerly CULTURE, TOURISM AND RECREATION; and CULTURE AND COMMUNICATIONS and TOURISM AND RECREATION	<p>Responded positively (verbally and June 24, 1992 letter) to 1991 Technically Preferred Route.</p> <p>Expressed some concerns over proposed minor alignment shift in Town of Markham Link (S3S). Need to verify significance of heritage features affected. Need to include Registered Archaeological Sites AIGt-14 and AIGt-35 in archaeological assessment of Technically Preferred Route since they are immediately adjacent to right-of-way and extent is unknown.</p> <p>Preliminary concerns about the project included impacts to the IBM Golf Course; implications for the Rouge Valley; and impacts to North Pickering hiking trails and conservation lands (July 6, 1989).</p> <p>Noted that municipal involvement is incorporated in study process and encouraged continued participation of municipal recreation officials to ensure identification of potentially affected community recreation facilities and sites (July 5, 1990).</p> <p>Regional staff have reviewed (the route alternatives) and have no comments at this time (August 7, 1990).</p> <p>Regional staff have reviewed (the Technically Preferred Route) and have no comments to make at this time (September 11, 1991).</p> <p>The heritage resources technical paper constitutes a good preliminary inventory of the cultural heritage resources along the corridor. Consult with local LACACs. Strongly recommend licensed archaeologists commence field work as soon as possible to ensure time for proper mitigation. (February 16/96)</p>	<p>Confirmed response in February 6, 1991 meeting with consultant staff.</p> <p>Incorporated recommendations in Further Work To Be Done for Built Features and Archaeological Resources components.</p> <p>Incorporated cited recreational considerations in analysis and evaluation of route alternatives. (Note: IBM and Minto Developments have plans to redevelop golf course site).</p> <p>Continued liaison with municipal recreation staff through Municipal Technical Team.</p> <p>MTO's historical and archeological staff have commenced field work in consultation with LACACs and MCzCR. Mitigation will be implemented in advance of construction.</p>

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ECONOMIC DEVELOPMENT AND TRADE* (Formerly INDUSTRY TRADE AND TECHNOLOGY)	Provided comments on Technically Preferred Route and expressed concern that, while consideration of effects on future development are important, effects on the existing east-west and north-south flow of goods and services on alternative routes do not appear to be addressed (September 6, 1991).	Traffic flow considerations have been addressed in transportation network planning and operations analyses.
EDUCATION AND TRAINING* (formerly EDUCATION and COLLEGES AND UNIVERSITIES)	<p>No comments in response to Study Initiation. Provided list of local school board contacts. Retain on contact list for information (not review).</p> <p>Advised MTO verbally that ministry does not wish to be involved further in any aspect of this project or <u>any</u> pre-submission consultation for EA studies conducted by MTO or other agencies.</p> <p>Ministry does not need to be involved in the study. Deal with the local school boards (January 31, 1996).</p>	<p>Contacted local school boards and noted information requirement.</p> <p>Confirmed conversation (June 21, 1989); cc: to MOEE EA Branch.</p> <p>Removed from contact list.</p>

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<p>ENVIRONMENT AND ENERGY* (Formerly Separate Ministries)</p>	<p>Referred to initial 407 plans to include High Occupancy Vehicle (HOV) lanes (November 20, 1990).</p> <p>Provided positive response to Technically Preferred Route. Posed questions/recommendations (December 3, 1991).</p> <ul style="list-style-type: none"> what will transit technology be transit should precede highway in the new corridor assumes HOV/ride sharing facilities will be included <p>Provided information on sustainable development (June 13, 1990).</p> <p>Provided initial response to proposed Evaluation Criteria with specific reference to wording and format for noise analysis and documentation of results, as well as input on transit assumptions for noise analysis purposes (2 separate letters March 20, 1990 plus additional letter July 27, 1990).</p> <p>Provided comments on Highway 407 Overview Study in the context of EA Act requirements, including associated policies and guidelines. Expressed some concern with respect to compatibility with GTA Urban Concept Study (November 16, 1990).</p>	<p>Incorporated in freeway/transit cross-section investigation and advised of related policy investigations. Committed to further liaison on HOV Lanes policy (January 3, 1991).</p> <p>MTO advised:</p> <ul style="list-style-type: none"> protecting for "GO Train System" modal prioritization will occur after EA approval obtained. Separate EA approval will be sought for transit reiterated that HOV policy is in formative stage and provided appropriate MTO contact. <p>Advised MOE that MTO is in initial stages of developing "sustainable development" policy and would incorporate sustainable development objectives in Highway 407 study process where practicable as policies and procedures are developed (June 26, 1990).</p> <p>Included suggestions for assessment of Highway 407 in Evaluation Criteria in compliance with MOE/MTO Noise Protocol (July 10, 1990). (Assumptions for transit will be refined in separate EA for Transitway).</p> <p>Met with MOE staff to discuss Overview comments, EA requirements for Transitway and EA submission strategy (January 7, and January 22, 1991).</p>

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ENVIRONMENT AND ENERGY* (cont'd)	<p>Central Region and District Offices indicated they had no outstanding concerns regarding route alternatives and would prefer to meet with the Study Team and make comments after the route evaluation process (November 1990).</p> <p>Requested outline of noise impacts along Technically Preferred Route in lieu of their having to review Environmental Technical Papers. Also requested additional outline of the manner in which the Transitway noise impacts will be addressed (May 23, 1991).</p> <p>Advised MTO of MOE participation and procedures for Individual EAs and indicated that the Ministry does not have the resources to conduct a review of the Technical Working Papers or the Technically Preferred Route. Review will occur once draft EA document has been prepared (September 23, 1991). Similar position expressed regarding proposed alignment shift in Town of Markham Link S3S) (September 18, 1992).</p> <p>Feb 8, 1996 meeting - advised on the kind of information required. Indicated a need to address air quality, ecosystem-based planning, monitoring, noise, water quality, and waste management. Provided additional clarification following meeting.</p> <p>Advised that MOEE anticipates a discussion of air quality impacts in the EA submission and that the proposed consultation process is adequate to ensure that groundwater, valley crossing and monitoring are addressed (July 15, 1996).</p>	<p>Confirmed Regional and District positions and advised of External Team information session on Technically Preferred Route (December 5, 1990).</p> <p>Provided MOEE with outline demonstrating compliance with Noise Protocol. Indicated that inclusion of rail component for Transitway had virtually no impact on the route selection process. Also addressed assessment of vibration, construction noise and mitigation measures (December 20, 1993).</p> <p>Confirmed MOEE position on reviews and MTO opportunities to request comments from MOEE on specific environmental technical factors directly from appropriate office (e.g. noise, stormwater) (November 30, 1992).</p> <p>Provided 1:10 000 scale plates of Technically Preferred Route (February 8, 1996)</p> <p>Provided outline of how MTO planned to address air quality, stormwater, traffic, noise, permits and approvals, and monitoring in the report and during the subsequent design phase. A draft Stakeholder Consultation Process was provided for MOEE's information and comment. (June 18, 1996)</p>

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ENVIRONMENT AND ENERGY* (cont'd)	Follow-up to November 6, 1996 meeting. Generally require a 90 day review period for both draft and final EA. Approach to air quality as set out in draft EA is acceptable. Suggested modifications to noise section in Chapter 6 of EA (November 8, 1996)	Provided status of EA Submission (Oct 2, 1996) Meeting to review MTO approach to issues raised in previous correspondence. (November 6, 1996) Modification made to draft EA to address points raised in meeting and November 8, 1996 letter.
HEALTH	Provided Public Health Inspection contact and advised that no technical contacts are required (July 7, 1989). Provided York and Durham Regional Health Unit contact; no response to Technically Preferred Route (May 22, 1990 and October 17, 1991).	Contact not required during Route Planning Phase. Initiated contact with Regional Health Units. Dropped Ministry of Health from contact list.
MUNICIPAL AFFAIRS AND HOUSING* (formerly two ministries)	Provided comments on consideration of potential impacts to Seaton Community. Assume that the study process will involve full participation by the planning staff of all affected local and upper tier municipalities (June 26, 1989). Advised MTO of Ministry's initiatives to address Seaton Community Group's "Seaton Planning Guide" (Steering Committee for coordination of stakeholder input) (July 17, 1991). Provided more extensive comments on route alternatives, as well as objectives for Seaton, citing advantages and disadvantages of "northerly" and "southerly" alignments without indicating a preference (January 29, 1991).	Study process included involvement of Planning and Public Works staff from upper and lower tier municipalities on Municipal Technical Team, plus other technical staff as required. Incorporated potential impacts to Seaton Community as a significant land use/transportation service consideration in the development and assessment of route alternatives. Requested more detailed response (October 17, 1990).

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<p>MUNICIPAL AFFAIRS AND HOUSING* (Cont'd)</p>	<p>Preference for a route as far south as possible until it passes the East Markham (Cornell) development site due to concern over loss of land for affordable housing (related to northerly relocation of Highway 7).</p> <p>Concern over time lapse between proposed Cornell implementation and EA approval for Highway 407 and resultant uncertainty for Cornell. Suggests segmenting EA for 407 to expedite approval process (April 17, 1990).</p> <p>Cornell advised that they had used technically preferred route as southern limit to development.</p> <p>The Seaton Planning Team supports the study as outlined provided that potential environmental effects are identified, analyzed and taken into account at an acceptable level of analysis. Want to be kept informed of the progress of the study (January 31, 1996).</p> <p>The Cornell Development Group advised that the Cornell planning has been done on the assumption that HWY 407 will follow the Technically Preferred Route and the Approved Secondary Plan for Cornell reflects this assumption (Sept. 23, 1996)</p>	<p>Recommendations on 407 cannot be provided within approved timeframe for Cornell.</p> <p>MTO has maintained liaison with the Cornell planning team and provided technical input as requested. Incorporated potential impacts to Cornell as a significant land use consideration.</p> <p>Incorporated comments in route analysis and evaluation process and requested that Project Team be kept informed on decisions considering disposition of Seaton Lands (February 4, 1991).</p> <p>Keep informed of progress of EA and design.</p>

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<p>NATURAL RESOURCES* (MNR)</p>	<p>Indicated that MNR Central Region should be the window for all contact since two MNR districts involved (June 13, 1989).</p> <p>Copy of letter to Markham identifying woodlot concerns (Feb. 21, 1990)</p> <p>Identified fisheries information requirements for Route Planning Phase (Oct. 1, 1990)</p> <p>MNR served as contact for Rouge Valley Advisory Committee (March 1992 until dissolution of Advisory Committee).</p> <p>No direct formal input/comments received but requested further information on minor alignment shift in Town of Markham (Link S3S).</p> <p>Staff of Maple and Lindsay Districts have completed their review of the Technically Preferred Route and are in favour (June 30, 1992).</p> <p>Provided comments on Draft Aquatic & Terrestrial Biological Study (January 17, 1996)</p> <p>MNR, DFO and MTRCA accepted fisheries terms of reference.</p>	<p>Confirmed and established Regional contact.</p> <p>Resulted in preparation of stand-alone Fisheries report and liaison as input to MTO/MNR Fisheries Protocol.</p> <p>MTO provided input to draft Rouge Park Management Plan regarding Highway 407 implications, particularly Phase 3 extension north of Steeles Avenue.</p> <p>Provided additional information package and advised that, in the absence of formal MNR response, the modified alignment is being carried forward to preliminary design (January 17, 1994).</p> <p>Provided a Draft of Aquatic & Terrestrial biological Study, for comments.</p> <p>Meeting with MNR & MTRCA to review comments on report (Feb 9, 1996). Agreed to additional fisheries field studies.</p> <p>Provided draft proposal for fisheries work for review (Apr 19, 1996)</p> <p>Field visit with MNR, MTRCA, STR, RPA to review access for foundation testing at proposed Rouge River Crossing (May 2, 1996).</p> <p>Fisheries field work carried out May-July 1996.</p>

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<p>NATURAL RESOURCES* (Cont'd)</p>	<p>Provided comments on Draft Stakeholder Consultation Process (July 30, 1996):</p> <ul style="list-style-type: none"> · inform MNR & MTRCA of all meetings · develop a compliance monitoring strategy · final design and construction reports will require MNR approval for env. issues · fisheries compensation plans will need MNR & DFO approval · Level 1 treatment will be required for stormwater · bridge runoff cannot be discharged directly to watercourses · want infiltration of stormwater reconsidered <p>Provided comments on draft fisheries report and Stakeholder Consultation Process (July/96)</p> <p>Provided further comments on Aquatic & Terrestrial Studies (Aug 22/96, Dec. 9/96) regarding points of clarification.</p> <p>Provided further comments on Stakeholder Consultation Process (Dec. 12/96).</p>	<p>Advised of subsequent consultation process, progress of fisheries studies, requirement for discussion on monitoring requirements, acceptance of 25mm/24hr stormwater detention requirement where warranted, and agreement to consider additional environmental protection measures during design. Provided Draft Stakeholder Consultation Process for comment. (June 24, 1996).</p> <p>Provided Draft 1996 Fisheries Inventory Report for review (Aug 8, 1996)</p> <p>Meeting held with MNR to review outstanding issues (Sept. 16/96)</p> <p>Fisheries report revised to address MNR comments. Joint meeting held with MTRC and RPA to review outstanding issues and revise Stakeholder Consultation Process to reflect their concerns (Sept. 30/96)</p> <p>Revisions made to Stakeholder Consultation Process and EA in response to concerns raised.</p>

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<p>SOLICITOR GENERAL AND CORRECTIONAL SERVICES* (formerly Separate Ministries)</p>	<p>No comments on Technically Preferred Route. In detail design must make provision for emergency access, adequate water supply (October 15, 1991).</p> <p>Requested that Regional Police Forces (York, Durham) be contacted to review Highway 407 proposal (April 26, 1991).</p> <p>Project does not affect Ministry's operations. No benefit to continued consultation (May 3, 1992).</p> <p>Have no facilities affected therefore Solicitor General and Correctional Services, Accommodation and Capital Planning Services Section do not need to be involved (January 31, 1996).</p> <p>The OPP would like to be kept informed of traffic projections.</p>	<p>Maintain contact for Preliminary Design Phase.</p> <p>Established formal contact with Regional Police Forces (information packages sent March 27, 1992).</p> <p>Removed Solicitor General from contact list.</p> <p>Keep OPP informed of traffic projections.</p>
<p>FINANCE (formerly TREASURY & ECONOMICS)</p>	<p>Ministry has no program responsibilities which would affect the siting of this facility or an assessment of its impact on the environment. No need to provide further documentation (September 5, 1991).</p>	<p>Removed from contact list at their request.</p>

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METROPOLITAN TORONTO AND REGION* CONSERVATION (MTRC)	<p>In response to Interim Technical Papers (May 8, 1990):</p> <ul style="list-style-type: none"> provided status of West Duffin management study recommended additional information sources for ground water need for additional input on Rouge Park implications north of Steeles Avenue <p>In response to Route Alternatives information package (June 25, 1990):</p> <ul style="list-style-type: none"> northerly routes preferable since valleys are narrower crossings of Rouge River and West Duffin Creek should be high-level and incorporate strict measures to protect environmental resources requested opportunity to incorporate an east-west trail link to north-south valley trails in association with the 407 project need to address sediment control; rehabilitation/replanting; fisheries habitat and wildlife corridor protection. <p>Provided input/comments on refined Natural Environment Technical Paper #1 (March 27, 1991).</p> <p>Expressed no significant concerns with Technically Preferred Route. Indicated interest in proposals for protecting watercourses and archaeological resources during future project phases. Advised of Authority's initiative to update 1982 ESA study commencing 1992.</p> <p>General agreement with alignment shift in Town of Markham (Link S3S) but expressed concern/requested clarification on potential impacts/intrusion of fill on valley of Little Rouge Creek (October 15, 1992).</p>	<p>Pursued contacts as practical and monitored status of West Duffin study for impacts to highway/transit corridor.</p> <p>Conducted preliminary design level of detail investigation for Rouge River crossing to determine that high-level alternatives is the best practical option. Incorporated comments in Evaluation Criteria and route alternative analysis/evaluation process.</p> <p>Provided Authority with clarification of Link S3S advantages (December 1, 1992)</p> <ul style="list-style-type: none"> original Link S3 requires more fill Little Rouge Creek valley at S3S is narrower and better defined and lends itself better to reducing fill in valley.

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<p>METROPOLITAN TORONTO AND REGION* CONSERVATION (MTRC) (Con't)</p>	<p>Clarified areas of concern over potential hydraulic impacts to Little Creek flood plain (i.e. appears to be more potential for encroachment of approach fill on valley with S3S than S3 (December 31, 1992).</p> <p>Provided comments on Detailed Aquatic & Terrestrial Biological Study:</p> <ul style="list-style-type: none"> - report is comprehensive & provides good inventory - recommended greater upstream & downstream investigation distances - asked about affects of local road realignments - see MNR's Rouge River Fisheries Management Plan, 1992 - study doesn't address impacts and mitigating measures - provided S4.3 of MTRCA's "Valley & Stream Corridor Management Program, 1994" for use when evaluating alternatives (Sept. 26, 1995) <p>Attended January 25, 1996 Review Agency Meeting to obtain update of study progress.</p> <p>MNR, DFO, MTRCA accepted fisheries study Terms of Reference.</p>	<p>Provided with Detailed Aquatic and Terrestrial Biological Study for comments.</p> <p>Meeting with MTRCA & MNR to review comments on Detailed Aquatic and Terrestrial Biological Study (Feb. 9, 1996)</p> <p>Provided draft proposal for fisheries work (Apr. 19, 1996) Fisheries work carried out May-July 1996.</p> <p>Field visit with MNR, MTRCA, STR, RPA to review access for foundation testing at proposed Rouge River crossing (May 2, 1996)</p> <p>Meeting with RPA staff & MTRCA to review Hwy 407 and discuss presentation of RPA Board (May 6, 1996)</p>

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METROPOLITAN TORONTO AND REGION CONSERVATION (MTRC) (Con't)	<p>Responded to Draft Stakeholder Consultation Process (SCP):</p> <ul style="list-style-type: none"> · several concerns with process and wording · review and approval role of MTRCA needs clarification · should have scheduled review meetings with review agencies · section dealing with objectives seems premature - edit to include concerns from "Valley & Stream Corridor Management Program, 1994" · concerns with watercourse design and criteria for stormwater controls · would be beneficial to meet. (Aug. 14/96) <p>Advised verbally of remaining outstanding concerns with Stakeholder Consultation Process. (November 14, 1996)</p> <p>Further comments on SCP (Dec. 6/96)</p>	<p>Draft Stakeholder Consultation Process provided for comment (June 18, 1996)</p> <p>Joint meeting held with MNR, MTRC and RPA to re-draft Stakeholder Consultation Process to address their concerns. Revised Stakeholder Consultation Process provided for information and endorsement.</p> <p>Stakeholder Consultation Process revised to address outstanding concerns.</p>

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APPENDIX 16 SUMMARY OF INPUT/COMMENTS RECEIVED FROM EXTERNAL TEAM

MINISTRY/AGENCY CONTACT	INPUT/COMMENTS	PROJECT TEAM RESPONSE/ACTION
<p>ROUGE PARK ALLIANCE* (RPA)</p>	<p>MNR served as contact for Rouge Valley Advisory Committee (March 1992 until dissolution of Advisory Committee).</p> <p>Attended January 25, 1996 Review Agency orientation meeting.</p> <p>Advised verbally that technical input provided via MTRCA (Feb. 5, 1996)</p> <p>RPA Board Resolution (May 15, 1996) - supporting the province securing environmental approvals to allow accelerated design and construction of Hwy 407 east of Markham Rd. based on the Technically Preferred Route and that the province report back with a detailed process plan.</p> <p>RPA Board Resolution (May 15, 1996) - accepting the Stakeholder Consultation Process subject to resolution of concerns of agencies and that the RPA have a close working relationship with MTO during the design phase.</p> <p>Provided comments on Draft Stakeholder Consultation Process based on July 5, 1996 internal meeting (July 23, 1996)</p> <p>RPA Resolutions commenting on SCP (Nov. 13/96, Dec 1/96)</p>	<p>MTO provided input to draft Rouge Park Management Plan regarding Highway 407 implications, particularly Phase 3 extension north of Steeles Avenue.</p> <p>Meeting with RPA staff and MNR to review Hwy 407 Extension Study and discuss presentation to the RPA Board. MTO agreed to provide information on project background, discussion with Federal Agencies re: CEAA, the problem being addressed by the study, and interim cost estimates. (May 6, 1996)</p> <p>Information provided to Save the Rouge on project background, Terms of Reference, study timetable, minutes of meeting with federal agencies, traffic findings, the problem statement and preliminary cost estimates (May 10, 1996)</p> <p>Presentation on the HWY 407 Extension Study to the RPA Board (May 15, 1996).</p> <p>Draft Stakeholder Consultation Process provided (June 18, 1996).</p> <p>Joint meeting held with MNR, MTRC and RPA to re-draft Stakeholder Consultation Process to address their concerns.</p> <p>Draft Stakeholder Consultation Process provided for information and endorsement. Presentation made to RPA Board (Nov. 13/96)</p> <p>SCP and EA revised I response to comments.</p>

* Indicates need for continued liaison at technical level

Highway 407/Transitway

Markham Road Easterly to Highway 7 East of Brock Road

APPENDIX 16

SUMMARY OF INPUT/COMMENTS RECEIVED FROM EXTERNAL TEAM

MINISTRY/AGENCY CONTACT	INPUT/COMMENTS	PROJECT TEAM RESPONSE/ACTION
OTHER AGENCIES		
INTERIM WASTE AUTHORITY*	<p>Initial verbal input indicating "long list" of IWA sites in Town of Pickering conflict with Highway 407 (January 1992).</p> <p>Provided Step 2 Report of landfill site search documentation (April 9, 1992).</p> <p>Provided documentation on long list of sites; 2 affect Highway 407 (M6 in York and EE4 in Durham). Indicates 407 will be addressed if these sites make the "short list" (June 1992).</p> <p>Provided short list of landfill sites, which includes M6 and EE4, and requests input (November, 1992). Subsequently, indicated IWA will only consider full (indirect) effects of relocating Highway 407 if M6 or EE4 are selected (February 1993).</p>	<p>Initial MTO/IWA meeting to review possible conflicts (February 11, 1992). Provided IWA with Technically Preferred Route and added to contact list. Also advise of possible alignment shift in Town of Markham (Link S3S).</p> <p>Planning Office provided comments as part of MTO response to IWA.</p> <p>MTO and Fenco review for compatibility with Highway 407 data. Requested IWA to identify timing and degree to which 407 will influence site selection (June 9, 1992).</p> <p>Fenco prepared packages for York-Metro and Durham IWA teams outlining the anticipated implications of having to move Highway 407 alignment if ML or EE4 selected and what process MTO would expect IWA to undertake in this regard (July/August 1993).</p>

* Indicates need for continued liaison at technical level

*Highway 407/Transitway
Markham Road Easterly to Highway 7 East of Brock Road*

APPENDIX 16 SUMMARY OF INPUT/COMMENTS RECEIVED FROM EXTERNAL TEAM

MINISTRY/AGENCY CONTACT	INPUT/COMMENTS	PROJECT TEAM RESPONSE/ACTION
OFFICE FOR THE GREATER TORONTO AREA (OGTA)*	<p>Provided verbal input and requested additional information on route alternatives (September 13, 1990).</p> <p>Indicated they have no comments on specific alignments but reiterated mutual concern that multi-purpose utility corridors should be explored and encouraged wherever possible (October 15, 1990).</p> <p>Expressed agreement with Technically Preferred Route. The facility is very important strategically, but for their purposes any of the alternatives proposed would be acceptable. Also agreed that transit in the corridor should be pursued (November 6, 1991).</p>	<p>Provided updated version of route alternatives and stressed need for OGTA input prior to completion of route evaluation process (September 13, 1990).</p> <p>Comments addressed by proposal for joint highway/transit corridor.</p>

*Indicates need for continued liaison at technical level

Highway 407/Transitway

Markham Road Easterly to Highway 7 East of Brock Road

APPENDIX 16 SUMMARY OF INPUT/COMMENTS RECEIVED FROM EXTERNAL TEAM

APPENDIX 17
SELECTED CORRESPONDENCE

APPENDIX 17.1
FEDERAL AGENCIES

**Canadian Environmental
Assessment Agency**



2655 North Sheridan Way
Mississauga, Ontario
L5K 2P8
Phone: (905) 823-4988
Fax: (905) 823-8503

Canadian Environmental Assessment Agency
13th Floor, Fontaine Bldg.
200 Sacre Coeur Blvd.
Hull, Quebec
K1A 0H3

June 20, 1996

Attn: Mr. Keith Grady

Dear Keith:

RE: HIGHWAY 407/MARKHAM ROAD FEASIBILITY STUDY

We are writing to provide some additional information on the Highway 407 project and to ask for your written agreement to the planned process.

The Ministry is preparing for the design and construction phases of Highway 407 east of Markham Road, which will include the identification and development of environmental mitigation and enhancement measures. It is important to maintain flexibility to allow the design team to develop a cost effective design. Therefore at this time we can only establish the objectives that will guide the design. However, the design team will be responsible for consulting with the affected agencies to ensure that the design is responsive to their concerns. In addition, it will be the design team that will apply for the federal approvals that will trigger CEAA. This will not occur until towards the end of the preliminary design phase.

Attached is a document describing the stakeholder consultation process that will be followed from now until the construction phase. It sets out the plans for involving affected agencies during the design phase and when various provincial and federal approvals, including environmental assessment, will be obtained. The issues raised during our March 13/96 meeting with DFO and DOE, have been presented as objectives to guide the design and construction phases. Attachment B to the Draft Stakeholder Consultation Process provides information on our understanding of the Federal approvals processes.

Canadian Environmental Assessment Agency
Mr. Keith Grady
June 20, 1996
Page 2

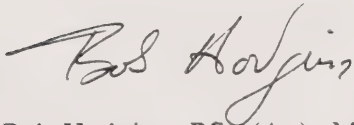
I have written to DFO, DOE and the Coast Guard, updating them on our study and requesting their agreement with our proposed process. Copies of these letters are attached.

Please review the attached Draft Stakeholder Consultation Process and provide me with written confirmation that it is acceptable to your agency. Based on discussions held with you and the Responsible Agencies (RA), we are proceeding on the understanding that this project qualifies for a screening rather than a comprehensive study, and that this determination is made by the Lead RA. Please confirm that our understanding of the CEAA classification is correct.

Thank you for your continued participation in this study. If you have any questions regarding this letter, please do not hesitate to give me a call.

Yours truly;

ECOPLANS LIMITED



Bob Hodgins, BSc (Ag), MBA
Manager, Mississauga Office

Encl.

c.c. Letters Only

F. Leech

P. Jankowski

D. Morneau

P. Reynolds

J. Dougall

I. Burkhardt

A. Robertson

P. Lacoste

W. Hyatt

**Canadian Transportation Agency
(Previously National Transportation
Agency)**



2655 North Sheridan Way
Mississauga, Ontario
L5K 2P8
Phone: (905) 823-4988
Fax: (905) 823-8503

National Transportation Agency
Rail Infrastructure Directorate
15 Eddy St., 17th Floor
Hull, Quebec
K1A 0N9

June 20, 1996

Attn: Mr. Paul Lacoste

Dear Paul:

RE: HIGHWAY 407/MARKHAM ROAD FEASIBILITY STUDY

We are writing to provide some additional information on Highway 407 project and to ask for your written agreement to the planned process.

The Ministry is preparing for the design and construction phases of Highway 407 east of Markham Road, which will include the identification and development of environmental mitigation and enhancement measures. It is important to maintain flexibility to allow the design team to develop a cost effective design. Therefore at this time we can only establish the objectives that will guide the design. However, the design team will be responsible for consulting with the affected agencies (including NTA) to ensure that the design is responsive to their concerns. In addition, it will be the design team that will apply for the federal approvals that will trigger CEAA. This will not occur until towards the end of the preliminary design phase.

Attached is a document describing the stakeholder consultation process that will be followed from now until the construction phase. It sets out the plans for involving affected agencies during the design phase and when various provincial and federal approvals, including environmental assessment, will be obtained. As you will note, the issues that were discussed at our March 13/96 meeting with DFO and DOE have been presented as objectives to guide the design and construction phases. Attachment B to the Draft Stakeholder Consultation Process provides information on the railway crossing and our understanding of the NTA/CEAA process. I have also attached a flow chart describing the process that will be followed for the NTA/CEAA approval for the railway crossing. It is based on telephone discussions with you and Claude David of your staff.

National Transportation Agency
Mr. Paul Lacoste
June 20, 1996
Page 2

Regarding the proposed crossing of the CPR Havelock Subdivision, we cannot at this time make specific commitments regarding design related issues. It will be the ongoing consultation during design and construction that will ensure that your interests and those of the expert agencies are addressed.

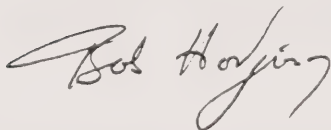
Please review the attached Draft Stakeholder Consultation Process and NTA Flow Chart, and provide me with written confirmation that they properly reflects the process for involving the NTA and that the objectives reflect your concerns. Please also confirm that the CEAA review for this project falls within the screening requirements rather than a comprehensive study, and that your agency will be the Lead Responsible Authority (RA) for the purposes of CEAA for the CPR crossing.

As agreed at the March 13, 1996 meeting, I am enclosing a copy of MTO's erosion and sedimentation control specification for your information.

Thank you for your continued participation in this study. If you have any questions regarding this letter, please do not hesitate to give me a call.

Yours truly;

ECOPLANS LIMITED



Bob Hodgins, BSc (Ag), MBA
Manager, Mississauga Office

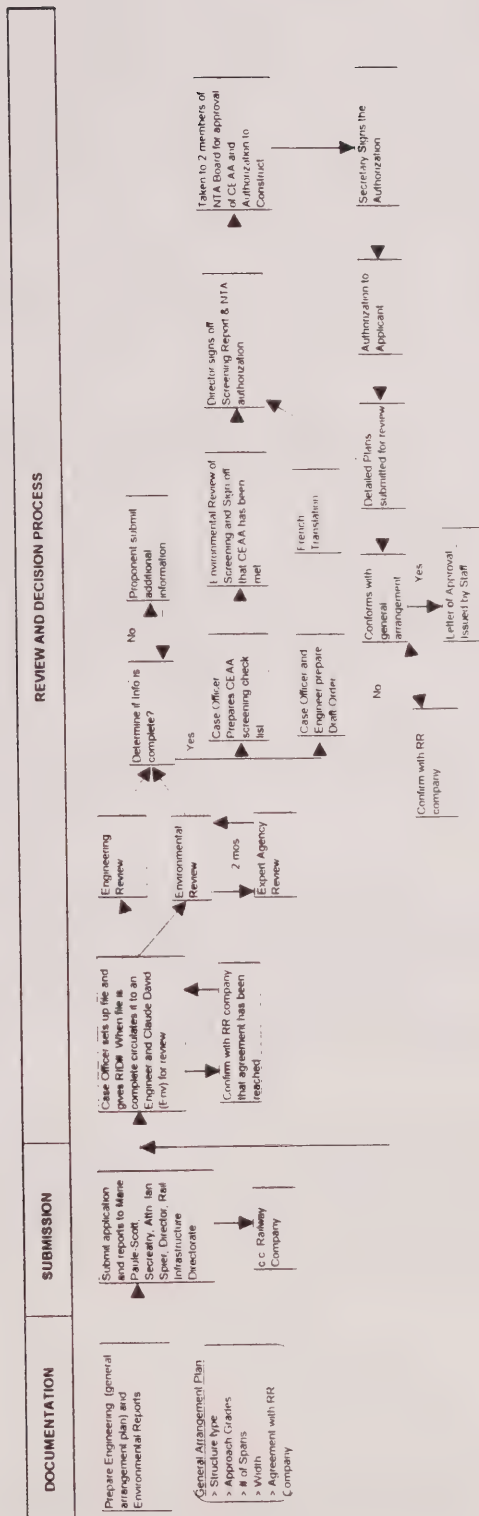
Encl.

c.c. Letters Only

F. Leech
P. Jankowski
D. Morneau
P. Reynolds

J. Dougall
I. Burkhardt
A. Robertson
K. Grady

NTA APPROVALS PROCESS (Including the CEEA Review)





September 24, 1996

Bob Hodgins
Manager
Ecoplans Limited
2655 North Sheridan Way
Mississauga, Ontario
L5K 2P8

352-20-003

Dear Mr. Hodgins:

Re: Grade Separation at Highway 407 and CP Havelock Subdivision

I am writing in response to your letter dated June 20, 1996, and recent telephone conversation where you request written confirmation relating to potential Agency involvement in the environmental assessment to be carried out under the Canadian Environmental Assessment Act (CEAA) for the above-captioned project.

You may be aware that as a result of the proclamation of the **Canada Transportation Act** (CTA), effective July 1, 1996, the National Transportation Agency has been continued as the **Canadian Transportation Agency**.

Please note that the CTA has replaced the **Railway Act** and now provides, under section 101, for parties to negotiate an agreement and file that agreement to become an Order of the Agency or for the Agency, upon application, to authorize the crossing. If an agreement or amendment is filed, it becomes an Order of the Agency in accordance with subsection 101(2) of the CTA, but does not trigger an environmental assessment under CEAA.

However, subsection 101(3) of the CTA provides that if a person is unsuccessful in negotiating an agreement or an amendment to an agreement, the Agency may, on application, authorize the construction of a suitable road crossing, utility crossing or related work, specify who shall maintain the crossing, and determine the apportionment

.../2

of the costs of constructing or maintaining the road crossing or utility crossing. Under those circumstances, the trigger for an environmental assessment under CEAA would be the *Law List Regulations* which reference subsection 201 (2) of the *Railway Act*, replaced by subsections 101(3) and 101(4) of the CTA.

I understand that the structure will be spanning the railway line only. Based on this and on information contained in Attachment B to the Draft Stakeholder Consultation Process, I can confirm that the Agency is likely to be the lead responsible authority for this project, should an Order from the Agency be required. I can also confirm that the environmental assessment of this project will consist of a project screening as defined under the CEAA.

I trust my answers to your questions are satisfactory. Should you have any further questions or require clarification, I can be reached at (819) 953-2117.

Sincerely,

A handwritten signature in dark ink, appearing to read 'P. Lacoste', with a long horizontal flourish extending to the right.

Paul Lacoste
Chief of Engineering
Rail Infrastructure
Directorate
Rail & Marine Branch

Environment Canada



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Protection

Water Planning and Management Branch
Inland Waters Directorate, Ontario Region
P.O. Box 5050, 867 Lakeshore Rd.
Burlington, Ontario L7R 4A6

Your file Votre référence

Our file Notre référence

April 8, 1992

P-90-03 1182-6 124/30

I.K. Upjohn
Principal Planner
Environmental Assessment Services
Transportation
Fenco Engineers Inc.
Atria North -Phase II
2235 Sheppard Ave. E.
Willowdale, Ontario
M2J 5A6

Dear Mr. Upjohn,

Re: Highway 407/Transit Transportation Corridor
Highway 48 -Whitby/Oshawa Boundary
Route Planning and Environmental Assessment Study

This is in response to your letter of March 27, 1992, regarding the environmental assessment for the above mentioned proposal.

Please be advised that Environment Canada has reviewed the material previously provided on the route selection of this project, and do not have any further concerns with or comments on the technically preferred route.

Thank you for the opportunity to comment on this proposal, and my apologies for not replying sooner.

Yours sincerely,

for W. Bill Bien
Chairman, Environmental Assessment
Coordinating Committee

cc: J. Carreiro, CWS
P. Reynolds, MTO

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Environmental Assessment Division
Water Planning and Management Branch
Inland Waters Directorate, Ontario Region
P.O. Box 5050, 867 Lakeshore Rd.
Burlington, Ontario L7R 4A8

Your file / Votre référence

Our file / Notre référence

P-90-03 1182-6 124/30

October 13, 1992

Mr. Patrick Reynolds
Project Manager
Transportation Planning Section
Ministry of Transportation
Central Region
3rd Floor, Atrium Tower
1201 Wilson Ave.
Downsview, Ontario
M3M 1J8

Dear Mr. Reynolds,

Re: Hwy 407 -Proposed Minor Realignment Change in Markham

This is in response to the letter of September 8, 1992, from Mr. Upjohn of Fenco Engineering Inc. regarding the proposed minor alignment shift of the Hwy 407/Transit Transportation Corridor in the Town of Markham.

Please be advised that Environment Canada has reviewed the material provided and we do not have any concerns with the alignment change as proposed.

Thank you for the opportunity to comment on this change in the proposal.

Yours sincerely,

W. Bill Bien
Chairman, Environmental Assessment
Coordinating Committee

cc: I.K. Upjohn, Fenco Engineering
J. Carreiro, CWS

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Environment Canada, Ontario Region
P.O. Box 6050, 867 Lakeshore Rd.
Burlington, Ontario L7R 4A6

File No.: F-95-98

April 2, 1996

Bob Hodgins
Manager, Mississauga Office
Ecoplans Limited
2655 North Sheridan Way
Mississauga, Ontario
L5K 2P8

Dear Mr. Hodgins,

Re: Hwy 407 East Partial Extension Study

As requested, Environment Canada -Ontario Region has reviewed the draft meeting notes of the 13 March 1996 meeting on the Hwy 407 East Partial Extension study. We have a few changes or comments on these notes, as detailed below.

Attachment 1

- Stormwater Management, p. 7, bullet 2 - It states that infiltration will not be a design objective of BMPs. However, it needs to be realized that infiltration from SWMPs will occur naturally when built over permeable soils. SWMPs may need to be designed to prevent infiltration in such conditions. As discussed and agreed to at the meeting, the following bullet should be added: "Monitoring of quality of groundwater adjacent to stormwater management ponds located in areas with permeable soils (silts, soils, gravels)." We consider sandy and gravelly soils to be highly permeable.

Response to DOE Information Requirements (Table)

- Stormwater Management Ponds, p. 11, item 2 - The reason for background info on soil quality conditions in areas for SWMP construction when soils are permeable is to have a baseline for comparison of monitoring data collected during operation of the facility to be able to determine if contamination of soils is occurring through infiltration from the ponds. Collection of this info is needed before construction.

I trust that these comments can be addressed in the final meeting notes. Do not hesitate to contact me at (905) 336-4953 if you wish to discuss these comments.

Yours sincerely,



Rob Dobos
Secretariat, Environmental Assessment Coordinating Committee
Environment Canada -Ontario Region

cc: B. Bien, EACC
M. Shaw, CAED
J. Fischer, ECB
A. Robertson, CCG
W. Hyatt, DFO



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Citizenship, Assessment & Economics Division
Great Lakes & Corporate Affairs Office
Environment Canada, Ontario Region
P.O. Box 5050, 867 Lakeshore Rd.
Burlington, Ontario L7R 4A6

File No.: F-95-98

February 15, 1996

Bob Hodgins
Ecoplans Limited
2655 North Sheridan Way
Mississauga, Ontario
L5K 2P8

Dear Mr. Hodgins,

Re: Hwy 407 Markham Area Extension Study

As a result of our recent phone discussion, I am providing you with some rather detailed guidance on information needs necessary to address issues related to Environment Canada's mandate which should be incorporated into the federal environmental assessment documentation for the above mentioned proposal.

The following comments are provided on behalf of Environment Canada -Ontario Region's (DOE-OR) Environmental Assessment Coordinating Committee (EACC) in context of section 12(3) of the *Canadian Environmental Assessment Act* (CEAA) as part of the overall screening of this project. Information and comments should not be construed as a fettering of the government's ability to make decisions and/or enforce any applicable regulations.

We expect that the scope of the federal EA will largely relate to the crossing of any waterbodies that are deemed navigable or where fish habitat will be harmfully altered. However, it is recognized that the the scope of the EA will be determined by the appropriate Responsible Authority for this project. It is also expected that the proposal will for the large part follow the preferred right-of-way for the Hwy 407 easterly from Hwy 48. Therefore, our focus will be on mitigation and enhancement measures primarily at the major stream crossings of this section of highway.

Water Issues

The water related issues generally encountered on provincial highway projects are broken down below into water quantity and water quality related issues for simplicity. As a minimum, we would require the following information, for both existing (base case) and proposed conditions, to adequately evaluate the credibility of analyses and data used to predict water related environmental impacts.

Water Quantity

Bridges and Culverts: Description of analysis and assumptions pertinent to proposal; summary of results for hydrologic and hydraulic analysis for design flows, including information on regulatory flows, upstream and downstream flood levels, and channel and flood plain flow velocities. Information on ice

regime and transport, such as: ice jam potential, normal ice cover, potential for formation of anchor ice and frazil ice. Details on soil types, vegetation cover, and resultant erosion potential for channel bed, banks, floodplain and overbanks. Estimates of base flows and minimum flows.

Stormwater Management Ponds (SWMP): Inflow and outflow hydrographs, stage storage discharge characteristics and, data on existing soil type, grain size distribution and permeability, permeability of liner material. Information on surrounding and regional groundwater levels, and location of any adjacent drinking water wells and other wells.

Stormwater Drainage: Dimensions and hydraulic characteristics of swales, ditches, sewer pipes, weirs, etc.

Water Quality

Bridges and Culverts: Water quality parameters (metals, chlorides, oil, grease, PAH's, BOD, suspended sediment, etc.) for watercourse, and for local surface runoff and groundwater.

Stormwater Management Ponds: Data on inflow and expected outflow water quality parameters (as for above), results of analysis of surrounding soils for contaminants. Information on design runoff volumes, event durations, expected influent/effluent sediment grain size distribution, detention times, sediment removal efficiency, and expected sediment accumulation rates. Any data available on the overall removal efficiency of pollutants associated with the trapped sediments should also be provided.

Data on surrounding and regional groundwater quality parameters, water quality parameters for any adjacent drinking water wells. Details of proposed maintenance procedures including expected frequency of sediment removal; and ongoing monitoring of the SWMP treatment efficiency.

Stormwater Drainage: Details of proposed maintenance procedures; and any spill contingency plans proposed during the operational phase of the highway.

Wildlife/Migratory Bird Issues

The following information should be provided for each stream crossing:

Wildlife

- both the scientific and common names of wildlife species which frequent the area, including migratory birds, mammals, amphibians, and reptiles;
- rare or unique species;

Wildlife Habitat

- a map of the spatial distribution of terrestrial, aquatic and riparian habitat types;
- a description of the structure, maturity and condition of each habitat (i.e. thriving, persisting, declining);
- colour photographs of major habitat types;
- both the scientific and common names of herbaceous, understory, and canopy vegetation for each habitat type;
- rare or unique species;
- a brief outline of the history and current degree of human influence on wildlife habitat, in terms of past and present land use.

Interpretation of Wildlife Habitat Value

Using the above information it is possible to provide the following:

- a map identifying areas critical to the life cycles of wildlife on or near the project site (e.g. bird breeding, feeding, staging, and roosting areas; turtle nesting sites; ESAs; wetlands; potential wildlife corridors; etc);
- a development drawing superimposed on a wildlife habitat map to show habitat potentially affected by the proposed undertaking.

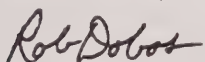
Development of Mitigation and Enhancement Measures

Once the value of the wildlife habitat has been determined, it is then possible to develop appropriate mitigation and enhancement measures. For example, if the ROW is part of an important corridor for small mammals, efforts should be made to maintain a linkage between adjacent habitats. Corrugated steel culverts are typically installed below the existing streambed invert to accommodate bedload movement within the culvert. This type of installation retains the natural stream bottom and slope, and eliminates the potential development of a drop at the outlet. Barriers to fish movement are effectively avoided, but this type of installation still does not allow for the free movement of small mammals. In areas containing wildlife corridors, arch-type culverts incorporating two side footings and a corrugated steel arch to support the fill, should be considered. Arch culverts and bridges are preferred over pipe culverts, because in addition to retaining the natural stream bottom and slope, there is usually enough exposed soil at lower water levels to provide for wildlife movement.

In some cases there may be an opportunity to retain exceptional tree specimens by altering the line of clearing at the edge of the ROW. At the very least, trees immediately outside the ROW should be protected from damage. In order to compensate for the loss of habitat within the ROW, consultants should consider enhancing the riparian zone of the existing watercourse channel, both upstream and downstream of the ROW. The planting of native tree, shrub, and herbaceous species on either side of the channel, will enhance terrestrial habitat, while providing shoreline stability, and shade. Habitat rehabilitation proposed both within, and outside of the ROW, should be described in a detailed site plan, indicating the location of all species to be planted. In general, when the Highway 401 to Highway 407 Links are located, lands designated for conservation purposes, and other valuable wildlife habitat, should be avoided.

I trust that these comments will be helpful. If you wish further clarification on the water issue requirements, please contact Mr. Mike Shaw of DOE at (905) 336-4957; or if you wish further clarification of wildlife issues, please contact Mr. John Fischer of DOE at (905) 336-4961.

Yours sincerely,



Rob Dobos

Secretariat, Environmental Assessment Coordinating Committee
Environment Canada -Ontario Region

cc: B. Bien, EACC
M. Shaw, CAED
J. Fischer, ECB
A. Robertson, CCG
W. Hyatt, DFO



2655 North Shenden Way
Mississauga, Ontario
L5K 2P8
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Environment Canada
Ontario Region
867 Lakeshore Road
P.O. Box 5050
Burlington, Ontario
L7R 4A6

June 20, 1996

Attn: Mr. Rob Dobos

Dear Rob:

RE: HIGHWAY 407/MARKHAM ROAD FEASIBILITY STUDY

Thank you for your April 2, 1996 letter providing further comments on the meeting notes from our March 13, 1996 meeting.

The Ministry is preparing for the design and construction phases of Highway 407 east of Markham Road, which will include the identification and development of environmental mitigation and enhancement measures. It is important to maintain flexibility to allow the design team to develop a cost effective design. Therefore at this time we can only establish the objectives that will guide the design. However, the design team will be responsible for consulting with the affected agencies (including DOE) to ensure that the design is responsive to their concerns. In addition, it will be the design team that will apply for the federal approvals that will trigger CEAA. This will not occur until towards the end of the preliminary design phase.

Attached is a document describing the stakeholder consultation process that will be followed from now until the construction phase. It sets out the plans for involving affected agencies during the design phase and when various provincial and federal approvals, including environmental assessment, will be obtained. As you will note, the issues that we discussed at our March 13/96 meeting have been presented as objectives to guide the design and construction phases. Attachment B to the Draft Stakeholder Consultation Process provides information on the federal approvals that will be required.

With respect to stormwater infiltration, it is clearly understood that DOE has a concern with the potential effects that infiltration of highway runoff could have on groundwater. The implications of such infiltration will be a consideration during the design of the stormwater management facilities. In the past, where warranted, the Ministry has used clay liners in stormwater management ponds to prevent infiltration. Your agency will have an opportunity to comment on the stormwater management program as it is being developed.

Environment Canada
Mr. Rob Dobos
June 20, 1996
Page 2

The Ministry has further considered the matter of monitoring and the collection of background soils data, and at this time is not prepared to commit to the monitoring of stormwater facilities or the collection of background soils data. During the design of the specific stormwater management program, consideration will be given to whether or not concerns still exist and how these concerns can be addressed.


Please review the attached Draft Stakeholder Consultation Process and confirm whether or not it adequately reflects the process for involving DOE, and that the objectives set out in the document reflect your concerns. CEAA will be triggered for the Rouge River Crossing (navigable waters) and the CPR crossing (NTA). The Coast Guard will be the Lead Responsible Authority (RA) for the Rouge River crossing, and the NTA will be the Lead RA for the CPR crossing. For all other crossings where CEAA is triggered by the need for a Fisheries Act Authorization, DFO (Fisheries and Habitat Management) will be the Lead RA. The Lead RAs will involve DOE as an expert department where they feel such involvement is necessary.

As agreed at our March 13, 1996 meeting, I am enclosing a copy of MTO's erosion and sedimentation control specification for your information.

Thank you for your continued involvement in this study. If you have any questions regarding this letter please do not hesitate to give me a call.

Yours truly;

ECOPLANS LIMITED



Bob Hodgins, BSc (Ag), MBA
Manager, Mississauga Office

Encl.

c.c. Letters Only
F. Leech
P. Jankowski
D. Morneau
P. Reynolds

J. Dougall
I. Burkhardt
A. Robertson
W. Hyatt

P. Lacoste
K. Grady



Environment Canada Environnement Canada

Environmental Policy, Planning, Assessment & Citizenship Division
Great Lakes & Corporate Affairs Office
Environment Canada, Ontario Region
P.O. Box 5050, 867 Lakeshore Rd.
Burlington, Ontario L7R 4A6

File No.: B-95-98

August 27, 1996

AUG 29 1996

Bob Hodgins
Manager, Mississauga Office
Ecoplans Limited
2655 North Sheridan Way
Mississauga, Ontario
L5K 2P8

Dear Mr. Hodgins,

Re: Highway 407/Markham Road Easterly Feasibility Study

This is in response to your letter of June 20, 1996, regarding the Stakeholder Consultation Process plan for the Highway 407 Markham Road Easterly proposal by the Ministry of Transportation (MTO). This document has been reviewed by Environment Canada Ontario Region's (DOE-OR's) Environmental Assessment Coordinating Committee (EACC) in context of our role as a Federal Authority (FA) per section 12(3) of the *Canadian Environmental Assessment Act* (CEAA) to assist those Responsible Authorities who may be required to conduct a screening for the project. Information and comments should not be construed as a fettering of the government's ability to make decisions and/or enforce any applicable regulations.

In general, we feel that the consultation process will adequately involve DOE in our role as an FA in the review of this project EA. With respect to the proposed "Objectives for Addressing Environmental Issues", they include numerous phrases such as "where possible", "where practical", "when warranted", etc. This leads to some uncertainty as to how adequately environmental issues will be addressed. We expect that the proponent will attempt to mitigate any potentially significant environmental affects of the project, as required under CEAA.

A specific comment with respect to the objective relates to sec. "1.1.5 Spills". We suggest that consideration be given in the design of stormwater drainage facilities to allow easy containment of accidental spills.

If you have any further questions regarding this project, I can be reached at (905) 336-4953.

Yours sincerely,

Rob Dobos
Secretariat, Environmental Assessment Coordinating Committee
Environment Canada -Ontario Region

cc: B.Bien, EACC, DOE
M.Shaw, GLCA, DOE
J.Fischer, ECB, DOE
W.Hyatt, FHM, DFO
A.Robertson, CCG,DFO
D.Ross, MNR
P.Lacoste, NTA





2655 North Sheridan Way
Mississauga, Ontario
L5K 2P8
Phone: (905) 823-4988
Fax: (905) 823-8503

Environment Canada
Ontario Region
867 Lakeshore Road
P.O. Box 5050
Burlington, Ontario
L7R 4A6

August 29, 1996

Attn: Mr. Rob Dobos

Dear Rob:

RE: HIGHWAY 407/MARKHAM ROAD FEASIBILITY STUDY

Thank you for your August 27, 1996 letter providing comments on the Draft Stakeholder Consultation Process.

The Ministry will attempt to mitigate potentially significant environmental affects of the Highway 407 project. It is through the consultation process that the Ministry will ensure that concerns are identified and addressed throughout the design and construction process.

With respect to spills, opportunities for providing easy containment of accidental spills on stormwater drainage facilities will be considered during the development of the Stormwater Management Plan (SWMP). Your agency will have an opportunity to participate in the development of the SWMP.

Thank you for your continued involvement in this study. If you have any questions regarding this letter please do not hesitate to give me a call.

Yours truly;

ECOPLANS LIMITED

A handwritten signature in cursive script that reads "Bob Hodgins".

Bob Hodgins, BSc (Ag), MBA
Manager, Mississauga Office

c.c. P. Jankowski
D. Morneau
P. Reynolds
J. Dougall

I. Burkhardt
A. Robertson
W. Hyatt
P. Lacoste

K. Grady
D. Ross

**Department of Fisheries & Oceans
Fisheries & Habitat Management/
Canadian Coast Guard**



Fisheries
and Oceans

Pêches
et Océans

Bayfield Institute
867 Lakeshore Road
P.O. Box 5050
Burlington, Ontario
L7R 4A6

Institut Bayfield
867, chemin Lakeshore
C.P. 5050
Burlington (Ontario)
L7R 4A6

Your file Votre référence

Our file Notre référence

1 November 1991

5250-510

Mr. Pat Reynolds
Transportation Planning Section
Ministry of Transportation
3rd Floor, Atrium Tower
1201 Wilson Avenue
Downsview, Ontario
M3M 1J8



Dear Mr. Reynolds,

RE: Highway 407/Transit Transportation Corridor
Route Planning and Environmental Assessment Study
Highway 48 - Whitby/Oshawa Boundary
Whitby/Oshawa Boundary to Highway 35/115

We have received reports from Fenco Engineers, Inc. and Parker Consultants, regarding additional information on the proposed extension of Highway 407 from Highway 48 to Highway 35/115. I understand that the Ministry of Natural Resources and the Ministry of Transportation are having ongoing meetings to discuss the implications of the project on fish and fish habitat and that the fisheries concerns are being addressed. The Department of Fisheries and Oceans will not actively participate in these negotiations until requested by the concerned parties. We will continue to monitor the developmental aspects of the Highway 407 extension related to the fisheries concerns and would like to be informed of any information updates.

If the Ministry of Natural Resources determines that the proposal will result in the harmful alteration, disruption or destruction of fish habitat, and the impacts cannot be mitigated, it will be referred to the Department of Fisheries and Oceans. The harmful alteration, disruption or destruction of fish habitat is prohibited unless authorized by the Department of Fisheries and Oceans pursuant to Section 35(2) of the Fisheries Act. In keeping with the Department's Policy for the Management of Fish Habitat, no authorizations will be issued unless acceptable measures to compensate for the habitat loss are developed and implemented. Furthermore, no authorizations will be issued in cases where the loss of a specific habitat type is considered unacceptable.

Canada

Since authorizing the harmful alteration, disruption or destruction of fish habitat, in accordance with the Fisheries Act is an area of federal decision making responsibility, the environmental impacts of the proposed project must be reviewed in accordance with the Environmental Assessment and Review Process Guidelines Order (EARP) (1984). The Department of Fisheries and Oceans, Fisheries and Habitat Management - Ontario will be an initiating department for the purposes of the EARP review. An authorization cannot be issued until a screening decision has been made and the requirements of EARP have been satisfied. Authorizations are issued once details of the compensation have been finalized.

The proposal has been given the following file number and name:

5250-510

Highway 407/Transit Transportation Corridor
Route Planning and Environmental Assessment Study

Please include this information on all subsequent correspondence.

Please feel free to contact me or Serge Metkosh at (416) 336-4861 or 336-4637, respectively, should you have any questions or wish to discuss any of the above in more detail.

Sincerely,



Wayne Hyatt
Fish Habitat Biologist
Fisheries and Habitat Management - Ontario Area

c.c. P. White, OMNR, Aurora



Fisheries
and Oceans

Pêches
et Océans

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867 Lakeshore Road
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Burlington, Ontario
L7R 4A6

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L7R 4A6

For info: voir référence

Our info: voir référence

October 14, 1992

5250-510

Mr. Patrick Reynolds, Project Manager
Transportation Planning Section
Ministry of Transportation
Central Region
3rd Floor, Atrium Tower
1201 Wilson Avenue
Downsview, Ontario
M3M 1J8

Dear Mr. Reynolds,

RE: Highway 407 - Proposed Alignment Shift in the Town of Markham

The Department of Fisheries and Oceans, Fisheries and Habitat Management, Ontario Area is interested in any proposal that may impact on fish and fish habitat. Tables 1 and 2 and the Comparison Between Segment S3 and Newly Developed Segment S3S indicate that the new alignment shift will reduce the impact Highway 407 will have at the Little Rouge Creek crossing. We support any measures that reduce impacts on fish and fish habitat.

Please contact me at (416) 336-6236 if you have any comments or wish to discuss any of the above comments.

Sincerely,

Wayne Hyatt
Fish Habitat Biologist
Fisheries and Habitat Management



Canada



Fisheries
and Oceans

Pêches
et Océans

Bayfield Institute

867 Lakeshore Road
P.O. Box 5050
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Institut Bayfield

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Burlington (Ontario)
L7R 4A6

Your file / *Votre référence*

Our file / *Notre référence*

525-1329

April 15, 1996

Ecoplans Limited
2655 North Sheridan Way
Mississauga, Ontario
L5K 2P8

APR 19 1996

Attention: Mr. Bob Hodgins

Dear Mr. Hodgins

RE: Highway 407 East Extension - March 13 Meeting

This proposal has been assigned the following file number and name:

525-1329 Highway construction, Highway 407 / Rouge River crossing

Please refer to it on any subsequent correspondence.

I have some comments regarding the meeting on March 13, 1996, as well as some general comments. As discussed at the meeting, the Department of Fisheries and Oceans will be involved in the review of the Rouge River crossing, as the *Canadian Environmental Assessment Act* (CEAA) will be triggered by the Department of Fisheries and Oceans, Canadian Coast Guard, under the *Navigable Waters Protection Act*. The Canadian Coast Guard will be the lead Responsible Authority for the review of this project under CEAA. The Department of Fisheries and Oceans, Fisheries and Habitat Management will also be a Responsible Authority if a *Fisheries Act* authorization is required. In this case, the Canadian Coast Guard and Fisheries and Habitat Management would conduct a joint review under CEAA.

Fisheries and Habitat Management will be involved in other water crossings where it is determined that proposed work will result in a harmful alteration, disruption of destruction of fish habitat, and the project is referred to our office for authorization.

Once a water crossing project is referred to us for authorization under the *Fisheries Act*, Fisheries and Habitat Management will determine if an authorization may be issued on the basis of the information provided and the mitigation and the compensation measures proposed. At that point CEAA will be triggered by Fisheries and Habitat Management-Ontario Area once a decision to issue an authorization has been made.

Note: Any request for *Fisheries Act* Authorization and supporting documentation will be part of the *Canadian Environmental Assessment Act* Public Registry and will be made available to members of the public, if requested.

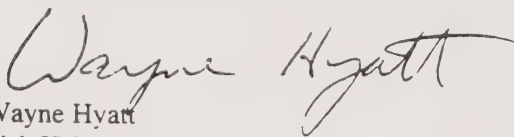
In areas of upwelling, bridges that completely span a watercourse are the most desirable type of crossing. Open bottom culverts are the next most desirable. Areas of upwelling may be subject to thermal impacts if inappropriate crossing methods are used, i.e. enclosed culverts.

Watercourses that will be spanned with bridges include the Rouge River, Little Rouge Creek and West Duffins Creek. There will be no inwater structures at these locations. There will be no infilling of any parts of these watercourses. The notes state that the existing channels of these watercourses will not be permanently altered. This indicates that there will be temporary alterations. These alterations would be reviewed for potential impacts after implementation of mitigation measures.

The table format for the watercourses, including proposed method of crossing, stream number used, flow characteristics, corridor value, and information on fisheries, wildlife, and vegetation is helpful. However, I have some concerns regarding flow characteristics, classification of habitat significance, and corridor value that will require further consideration. The table does provide a quick reference that links the watercourse and relevant information. This type of format will be useful when reviewing the project. It can be expanded to include mitigation and compensation measures proposed, where appropriate.

When dealing with the water quality issue, thermal impacts to watercourses should be taken into account, especially for coldwater and coolwater systems. Classification of streams should be as determined by the Ontario Ministry of Natural Resources. Water quality and quantity should be addressed regarding highway runoff.

Please contact me at (905) 336-6236 or FAX (905) 336-4819 should you have any questions regarding my comments.



Wayne Hyatt
Fish Habitat Biologist
Fisheries and Habitat Management-Ontario Area

c.c. Dave Ross - OMNR, Maple
 Rob Dobos - DOE, Burlington
 Al Robertson - CCG, Prescott



2655 North Sheridan Way
Mississauga, Ontario
L5K 2P8
Phone: (905) 823-4988
Fax: (905) 823-8503

Department of Fisheries and Oceans
867 Lakeshore Road
P.O. Box 5050
Burlington, Ontario
L7R 4A6

June 20, 1996

Attn: Mr. Wayne Hyatt

Dear Wayne:

**RE: HIGHWAY 407/MARKHAM ROAD FEASIBILITY STUDY
YOUR FILE #525-1329**

Thank you for your April 15, 1996 letter in which you provided clarification on the process for obtaining authorization under the Fisheries Act, and your comments on the notes from our March 13th meeting.

The Ministry is preparing for the design and construction phases of Highway 407 east of Markham Road, which will include the identification and development of environmental mitigation and enhancement measures. It is important to maintain flexibility to allow the design team to develop a cost effective design. Therefore at this time we can only establish the objectives that will guide the design. However, the design team will be responsible for consulting with the affected agencies (including DFO) to ensure that the design is responsive to their concerns. In addition, it will be the design team that will apply for the federal approvals that will trigger CEAA. This will not occur until towards the end of the preliminary design phase.

Attached is a document describing the stakeholder consultation process that will be followed from now until the construction phase. It sets out the plans for involving affected agencies during the design phase and when various provincial and federal approvals, including environmental assessment, will be obtained. As you will note, the issues that we discussed at our March 13/96 meeting have been presented as objectives to guide the design and construction phases. Attachment B to the Draft Stakeholder Consultation Process provides information on our understanding of the Fisheries Act/CEAA process.

Department of Fisheries and Oceans
Mr. Wayne Hyatt
June 20, 1996
Page 2

At this point in time, we cannot make specific commitments regarding the bridge crossings. However, the design objectives for the bridges will be to avoid in-water structures, infilling of the watercourses, interference with navigation (where applicable), and alterations to the watercourse. It will be the ongoing consultation during design and construction that will ensure that your interests are addressed.

When developing the stormwater management program, water quantity and quality issues will be addressed. This includes thermal implications for watercourses. Again, you will have an opportunity to comment on the stormwater management plan.

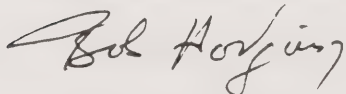
Please review the attached Draft Stakeholder Consultation Process and provide me with written confirmation that it properly reflects the process for involving DFO (Fisheries and Habitat Assessment) and that the objectives reflect your concerns. Please also confirm that should CEAA be triggered through the requirements for a Fisheries Act authorization, that this project falls within the screening requirements rather than a comprehensive study and that your agency will be the Lead Responsible Authority (RA) for the purposes of CEAA, except for the Rouge River crossing. The Coast Guard will be the Lead RA for the Rouge Crossing even if Fisheries Act authorization is required.

As agreed at our March 13, 1996 meeting, I am enclosing a copy of MTO's erosion and sedimentation control specification for your information.

Thank you for your continued participation in this study. If you have any questions regarding this letter, please do not hesitate to give me a call.

Yours truly;

ECOPLANS LIMITED



Bob Hodgins. BSc (Ag), MBA
Manager, Mississauga Office

Encl.

c.c. Letters Only
F. Leech
P. Jankowski

D. Morneau
P. Reynolds
J. Dougall

I. Burkhardt
A. Robertson
K. Grady



Fisheries
and Oceans

Pêches
et Océans

AUG - 2 1996

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Your file *Votre référence*

Our file *Notre référence*

525-1329

July 29, 1996

Ecoplans Limited
2655 North Sheridan Way
Mississauga, Ontario
L5K 2P8

Attention: Mr. Bob Hodgins

Dear Mr. Hodgins

RE: Highway 407 / Markham Road Feasibility Study

Thank you for the 'Draft Stakeholder Consultation Process - Highway 407 Markham Road Easterly', Ministry of Transportation, June 1996. I have reviewed the document and have the following comments.

We understand your request for flexibility in dealing with the information that we may request as part of our review, and the proposed timing of submission of that information. We will endeavour to be as flexible as possible, however, there may be information requirements that must be satisfied before we may proceed with our review process. On-going consultation will help to foresee those situations.

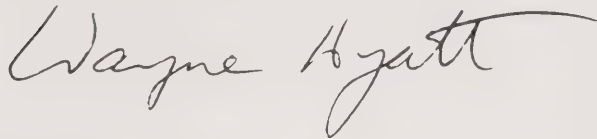
The proposed objectives contain numerous phrases such as 'where possible', 'where practical', 'where feasible', 'when warranted', which are vague. Impacts to the environment must be mitigated to the greatest extent possible. Appropriate priorities in construction and operational practices must be established and maintained that protect and/or improve the value of the resources for future users.

Monitoring will be required for crossings where *Fisheries Act* authorizations are required. It is the responsibility of the proponent to develop a Monitoring Plan. Consultation with the various agencies involved will ensure that an appropriate monitoring plan is developed. The final plan will be reviewed by government agencies for acceptability.

In situations where the Ontario Ministry of Natural Resources (OMNR) refers a project to DFO-FHM for authorization under the *Fisheries Act*, an 'Application for Authorization for Works or Undertakings Affecting Fish Habitat' should be requested by the Ministry of Transportation, Ontario, from DFO-FHM. A decision to issue a *Fisheries Act* authorization for a harmful alteration, disruption or destruction of fish habitat is dependent on the nature of habitat loss and the adequacy of compensation for the loss in keeping with the No Net Loss guiding principle of the 'Policy for the Management of Fish Habitat'. When a decision to issue a *Fisheries Act* authorization has been made, the *Canadian*

Environmental Assessment Act (CEAA) will be triggered. Where DFO-FHM is the lead Responsible Authority, a screening will be made under CEAA. A 'Letter of Intent to Implement Fish Habitat Compensation and Mitigation Measures' must be developed between the parties involved, i.e. the proponent, OMNR, and DFO-FHM, prior to issuing an authorization under the *Fisheries Act*.

Please contact me at (905) 336-6236 or FAX (905) 336-4819 should you have any questions regarding my comments.

A handwritten signature in black ink that reads "Wayne Hyatt". The signature is fluid and cursive, with a long horizontal stroke at the end.

Wayne Hyatt
Fish Habitat Biologist
Fisheries and Habitat Management-Ontario Area

c.c.	Dave Ross	- OMNR, Maple
	Rob Dobos	- DOE, Burlington
	Keith Grady	- CEA Agency



Canadian
Coast Guard

Garde côtière
canadienne

P.O. Box 1000
Prescott, Ontario
K0E 1T0

April 30, 1996

Your file Votre référence
8200-96-6063

Our file Notre référence

ECO Plans Ltd.
2655 North Sheridan Way
Mississauga, Ontario.
L5K 2P8

Attn: Mr. Bob Hodgins
Bsc., MBA, Manager

Dear Bob:

***Highway #407 - Proposed Extension East of Highway
#48, Regional Municipality of York, Province of Ontario***

Reference is made to your January 30, 1996 letter sent to our Sarnia office and our meeting of March 13, 1996.

As we discussed March 13th, I reviewed and inspected the 27 potential watercrossings as outlines in your January 30, 1996 letter.

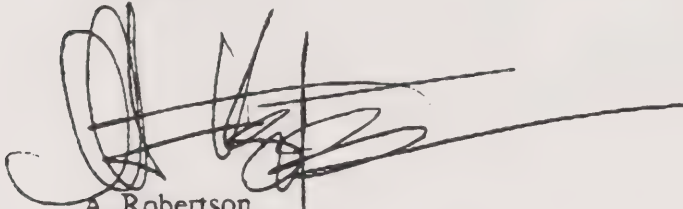
I can confirm that the **Rouge River** crossing is the only waterway **considered navigable** for the purposes of the *Navigable Waters Protection Act*.

As discussed, you will require both *Canadian Environmental Assess Act* and the *Navigable Waters Protection Act* approval from our Department for this crossing.

Please forward all relative material to me as soon as possible to initiate our CEAA review.

If you have any questions concerning the process, please contact me at your convenience at 613-925-2865 ext. 255.

Yours truly

A handwritten signature in black ink, appearing to be 'A. Robertson', written over a horizontal line.

A. Robertson
Navigable Waters Protection
Program Officer
Canadian Coast Guard
Prescott Base

cc. EMOAE

DOE - R. Dobos

DFO - W. Hyatt



2655 North Sheridan Way
Mississauga, Ontario
L5K 2P8
Phone: (905) 823-4988
Fax: (905) 823-8503

Department of Fisheries and Oceans
Canadian Coast Guard
P.O. Box 1000
Prescott, Ontario
K0E 1T0

June 20, 1996

Attn: Mr. Al Robertson

Dear Al:

RE: HIGHWAY 407/MARKHAM ROAD FEASIBILITY STUDY

We are writing to provide some additional information on the Highway 407 project and to ask for your written agreement to the planned process.

The Ministry is preparing for the design and construction phases of Highway 407 east of Markham Road, which will include the identification and development of environmental mitigation and enhancement measures. It is important to maintain flexibility to allow the design team to develop a cost effective design. Therefore at this time we can only establish the objectives that will guide the design. However, the design team will be responsible for consulting with the affected agencies (including CCG) to ensure that the design is responsive to their concerns. In addition, it will be the design team that will apply for the federal approvals that will trigger CEAA. This will not occur until towards the end of the preliminary design phase.

Attached is a document describing the stakeholder consultation process that will be followed from now until the construction phase. It sets out the plans for involving affected agencies during the design phase and when various provincial and federal approvals, including environmental assessment, will be obtained. As you will note, the issues that we discussed at our March 13/96 meeting have been presented as objectives to guide the design and construction phases. Attachment B to the Draft Stakeholder Consultation Process provides information on our understanding of the NWPA/CEAA process. I have also attached a flow chart describing the process that will be followed for the NWPA/CEAA approval for the Rouge River crossing. It is based on our telephone discussions.

Canadian Coast Guard
Mr. Al Robertson
June 20, 1996
Page 2

Regarding the proposed Rouge River crossing, we cannot at this time make specific commitments regarding design related issues. However, the design objectives will be to avoid in-water structures, infilling of the watercourses and alterations to the watercourse, and to maintain navigation. It will be the ongoing consultation during design and construction that will ensure that your interests are addressed.

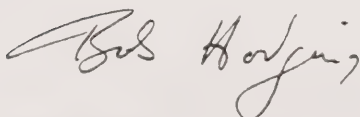
Please review the attached Draft Stakeholder Consultation Process and NWPA Flow Chart, and provide me with written confirmation that they properly reflects the process for involving DFO (Canadian Coast Guard) and that the objectives reflect your concerns. Please also confirm that the CEAA review for this project falls within the screening requirements rather than a comprehensive study, and that your agency will be the Lead Responsible Authority for the Rouge River Crossing.

As agreed at our March 13, 1996 meeting, I am enclosing a copy of MTO's erosion and sedimentation control specification for your information.

Thank you for your continued participation in this study. If you have any questions regarding this letter, please do not hesitate to give me a call.

Yours truly;

ECOPLANS LIMITED



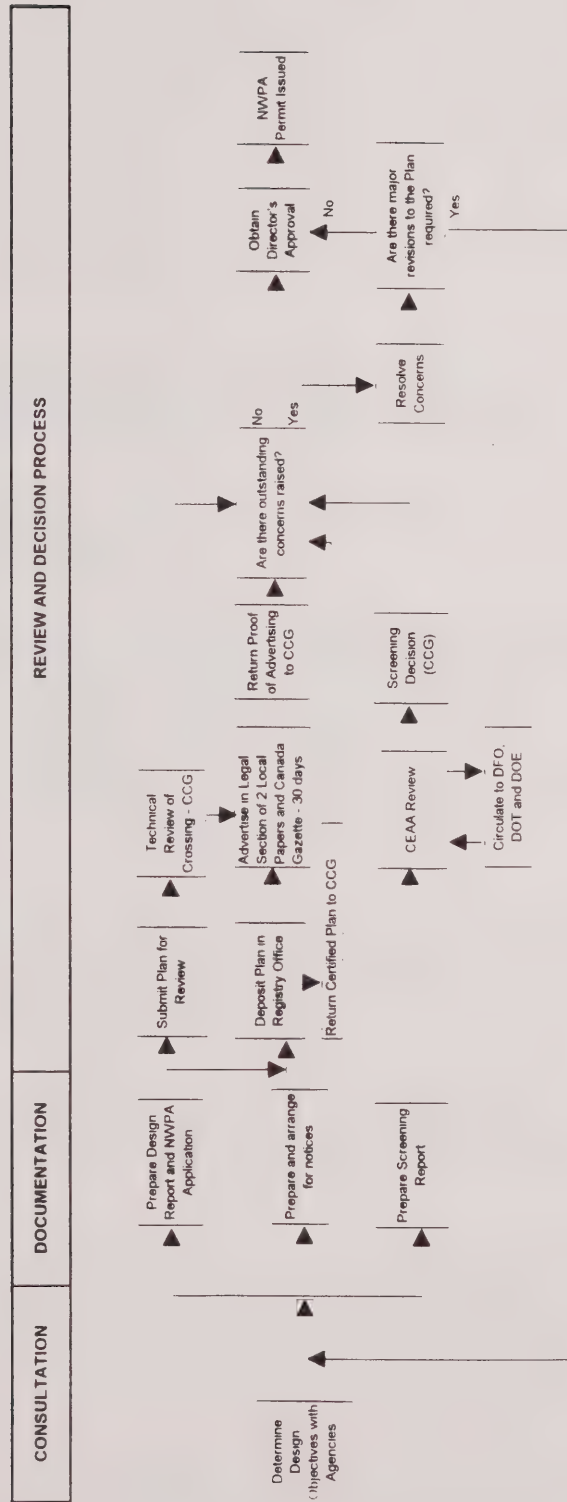
Bob Hodgins, BSc (Ag), MBA
Manager, Mississauga Office

Encl.

c.c. Letters Only
F. Leech
P. Jankowski
D. Morneau
P. Reynolds

J. Dougall
I. Burkhardt
K. Grady

NWPA APPROVALS PROCESS





Canadian
Coast Guard

Garde côtière
canadienne

P.O. Box 1000
Prescott, Ontario
K0E 1T0

October 2, 1996

Your file Votre référence
8200-96-6063

Our file Notre référence

Ecoplans Limited
2655 North Sheridan Way
Mississauga, Ontario
L5K 2P8

01.1 - 1.1.1.1

Attn: Mr. Bob Hodgins

Dear Mr. Hodgins:

Re: Highway #407 Markham Road Feasibility Study

I have reviewed the documents enclosed with your June 20, 1996 letter concerning the design/approval of the above noted project.

The flow chart entitled "*Navigable Waters Protection Act Approval Process*" appears to adequately describe the approvals/*Canadian Environmental Assessment Act (CEAA)* decision process. I note that in the task box "*Deposit Plan in Registry Office*" this action should only be carried out following the direction from Coast Guard. Also in the action box "*circulate to Department of Fisheries and Oceans, Department of Transport and Department of the Environment*" you should include "*and other Federal Authorities as appropriate*".

The "*Stakeholder*" document was also reviewed. I would like to advise you that the *CEAA* requires decision and satisfactory mitigation measures before any Federal approvals can be issued. In order to receive a final decision all *Federal Authorities* must be satisfied with the *Environmental Assessment* documents and mitigation.

This obviously requires a firm commitment to undertake all mitigation measures developed during the *CEAA* review. The "*Stakeholders*" document remains somewhat vague in these areas.

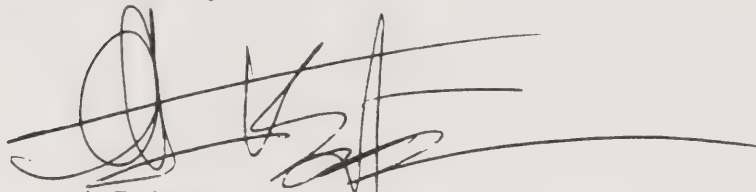
During our March 13, 1996 meeting in Burlington, the Coast Guard and Fisheries Habitat Management concluded that, for the Rouge River bridge crossing, the Coast Guard would be the coordinating Responsible Authority for the *CEAA* review. With the current information, I envision the *CEAA* review will not be a comprehensive review nor a panel.

Canada

I have forwarded the documents to our Regional Office for a review and addition comments where appropriate.

If you have any questions, please call me at 613-925-2865 ext. 255.

Yours truly

A handwritten signature in black ink, appearing to be 'A. Robertson', written over a horizontal line.

A. Robertson
Navigable Waters Protection
Program Officer
Canadian Coast Guard
Prescott Base

cc. DOE
EWOAE
DFO - Habitat

Indian and Northern Affairs



Indian and Northern
Affairs Canada

Affaires indiennes
et du Nord Canada

5010-4-1

~~5000-1~~

July 7, 1989

Your file Votre référence

Our file Notre référence

5000-1

Patrick J. Reynolds
Senior Transportation Planner
Transportation Planning Section
M.T.O. Central Region,
5000 Yonge Street
Willowdale, Ontario
M2N 6E9

Dear Mr. Reynolds:

re: Environmental Assessment study for proposed Highway 407 from
Hwy 48 in Markam easterly to Hwy 35/115 in Newcastle

The highway project does not directly affect any of the lands
administered by our department.

Thank you for consulting us and please do not hesitate to do so
in the future.

Yours truly,

John Higham
Manager, Environmental Planning and Management
Lands, Revenues and Trusts

Canada



Indian and Northern
Affairs Canada

Affaires indiennes
et du Nord Canada

Your file Votre référence

Our file Notre référence

13 January, 1992

5000-7-NI(L26)

Mr. Patrick Reynolds
Project Manager
Transportation Planning Section
3rd Floor, Atrium Tower
1201 Wilson Avenue
Downsview, Ontario
M3M 1J8

Dear Mr. Reynolds

Re: Highway 407/Transit Transportation Corridor
Route Planning and Environmental Assessment Study
Oshawa/Whitby Boundary to Highway 35/115
WP 326-88-01

RECEIVED	
JAN 24 1992	
Route To:	In
IKU	g
File:	

I am writing on behalf of the Department of Indian and Northern Affairs Canada regarding the Highway 407 Transit Transportation Corridor. A cursory review of the information provided to us indicates that this project does not appear to impact the mandate of this department. Therefore, we will not be participating in your consultation process or any subsequent environmental assessment review.

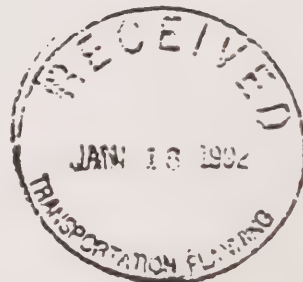
Thank you for providing this department with the opportunity to participate in your study.

Sincerely

Helen McCallum

Helen McCallum
Environmental Planning and Management Officer
Lands, Revenues and Trusts
Ontario Region

25 St. Clair Ave. E., 5th Floor
Toronto, Ontario
M4T 1M2



Canada

January 19, 1996

Ms. Denise Morneau
Project Manager
McCORMICK RANKIN
2855 North Sheridan Way
Mississauga, Ontario
L5K 2P8

3199

5010-4-1 (L28)

**Re: Study to Address Traffic and Environmental Issues
Associated with the Opening of Highway #407 at
Highway 48**

Thank you for your letter/fax of January 17, 1996 with regard to the above study.

Our department had previously commented on this same project in a letter dated July 7, 1989, addressed to Mr. Patrick J. Reynolds, indicating that we do not have any concerns regarding this project. That remains our position and, as such, we will not be attending the meeting on January 25, 1996. A copy of this letter is enclosed for your files.

Thank you for providing us the opportunity to participate in your study process.

Sincerely,
Original Signed By:
Michele K. Jones

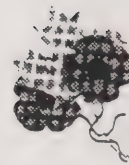
Michele K. Jones
Environmental Assistant
Environment and Natural Resources
Lands and Trust Services
Ontario Region

25 St. Clair Avenue East, 5th Floor
Toronto, Ontario
M4T 1M2

Encl.



April 10, 1996



CANADA REMEMORANCE
LE CANADA SE

Votre référence

W.O. 3199-96

Notre référence

5010-4-1(L28)

Mr. John Sutherns, P.Eng.
McCORMICK RANKIN
2655 North Sheridan Way
Mississauga, Ontario L5K 2P8

Dear Mr. Sutherns,

Re: Study to Address Environmental Issues of Opening of Highway #407 at Markham Road

Thank you for your fax/letter of March 15, 1996 with regard to being invited to attend your Public Consultation Sessions.

From our review of the information provided, our department has previously commented on two other letters on this particular project. Attached, please find our comments from those letters. In addition, we request that our department be removed from your reviewers list with regard to this study.

In closing, I wish to thank you for providing us with the opportunity to participate in your public consultation session and comment on this study.

Sincerely,

Michele K. Jones

Michele K. Jones
Environmental Assistant
Environment & Natural
Resources
Lands and Trust Services
Ontario Region

25 St. Clair Avenue East, 5th Floor
Toronto, Ontario M4T 1M2

Att.

Canada

Transport Canada

Transport
Canada

Transports
Canada

Assistant Deputy Minister

Sous-ministre adjoint

Airports Authority Group

Groupe de gestion des aéroports

Place de Ville
Ottawa
K1A 0N8

June 26, 1990

Mr. C. Vervoort
Regional Director
Central Region
Ministry of Transportation
1201 Wilson Avenue
Downsview, Ontario
M3M 1J8



Dear Mr. Vervoort:

The Airports Group has reviewed your request of 9 May 1990, regarding the provision of formal input in the planning process for Highway 407 in the vicinity of the federal Pickering lands held for potential airport development.

As you are aware, the federal government acquired the Pickering site in 1973 with the intention of constructing a major airport. Since the postponement of the airport's development in 1975, the majority of the lands within the site have been retained in their original agricultural state. Subsequent examinations have indicated that in all probability there will be a "core area" to be retained for air transportation purposes, and a "surplus area" to be disposed of in some manner. However, the federal government intends to protect the entire Pickering site for future airport development, pending the completion of ongoing studies and the federal environmental review process related to Pearson Airport and aviation in southern Ontario, which were announced last August by the Minister of Transport.

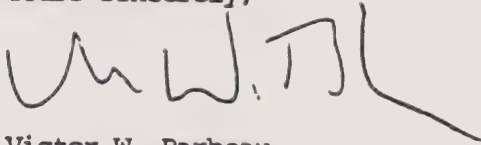
With this background in mind and the obvious requirement for quality access and compatibility with any future airport, the Airports Group has examined the alternative routings for the proposed Highway 407.

- Routes C2 & SC2 would conflict with airport development and we find them not acceptable.
- Route S5/S6 avoids the federal Pickering land and we have no specific comment on its location, but are concerned about its ability to provide access to the site. We request that a dedicated airport access be included, perhaps by an additional or specially designed interchange in the Brock Road area.
- Route C9 is preferred from an airport development view, but would require dedicated access to the site.

Our preference for C9 should not be viewed as a commitment of the federal government.

We trust the above addresses the input sought in your letter. As you are aware, Mr. Ron Binnie, my Regional Director General, Airports Group, Ontario Region, will be able to provide you with additional assistance as may be required in the ensuing phases of the highway development.

Yours sincerely,

A handwritten signature in dark ink, appearing to read 'V. W. Barbeau', with a long horizontal stroke extending to the right.

Victor W. Barbeau



Transport
Canada

Transports
Canada

Airports

Aéroports

4900 Yonge Street,
Suite 300
Willowdale, Ontario
M2N 6A5

Votre référence

Our file **5168-1-555**

August 28, 1991

Mr. Patrick Reynolds,
Project Manager
Transportation Planning Section
Ministry of Transportation
3rd floor, Atrium Tower
1201 Wilson Ave.,
Downsview, Ontario
M3M 1J8

Dear Mr. Reynolds:

RE: Highway 407/Transit Transportation Corridor
Highway 48 - Whitby/Oshawa Boundary
Route Planning and Environmental Assessment Study

This is in response to I.K. Upjohn's letter dated 23 August 1991, concerning the above-captioned subject.

This Department has no objection or further comments on the matter. However, please keep this Department informed of any future developments.

Yours truly,

R.S. Binnie
Regional Director General,
Airports Group
Ontario Region



Canada

**TRANSPORT CANADA** Highway Policy and Programs**TRANSPORTS CANADA** Politiques et programmes routiers

FACSIMILE TRANSMITTAL FORM

BORDEREAU DE TRANSMISSION POUR TELECOPIEUR

To/ A : BOB HODGINS
Ecoplans Limited

Phone\Telephone: 1-905-823-4988

Fax\Télécopieur: 1-905-823-8503

From\De: JIM LOTHROP
Environmental Engineer

Phone\Telephone: (613) 998-1902

Fax\Télécopieur: (613) 998-2686

Number of pages(including this one)

1

Nombre de Pages(y compris la présente):

Date: 18 January 1996

Message:

Bob,

Transport Canada, Highway Policy and Programs, has reviewed the information you sent on the opening of Highway 407 at Highway 48. Since our department is not involved in the funding of this portion of Highway 407, we do not have a trigger under the *Canadian Environmental Assessment Act* and will not be attending the January 25th meeting. Should you have any further questions please feel free to contact me at the above number.

Jim

Canada



2655 North Sheridan Way
Mississauga, Ontario
L5K 2P8
Phone: (905) 823-4988
Fax: (905) 823-8503

Transport Canada
Airports
Pickering Land Project
4900 Yonge Street, Suite 300
North York, Ontario
M2N 6A5

January 31, 1996

Attn: Mr. Bruce Farrow

Dear Mr. Farrow:

**RE: HIGHWAY 407 EXTENSION - ENVIRONMENTAL ASSESSMENT
PROJECT # 3199**

This is to confirm our telephone conversation regarding the involvement of your Department in the above study. The following is my understanding of your position:

- 1) Your Department is opposed to any Pickering Airport lands being used for this project.
- 2) Your Department has no objection to the technically preferred route as identified in the earlier studies.
- 3) Because none of your lands are to be used for this project, there is no Trigger under the Canadian Environmental Assessment Act, and therefore you need not be involved in the CEAA screening.
- 4) Because you have a keen interest in the overall Highway 407 project as it relates to access to the airport lands, you would like to be kept informed of the progress of the study.

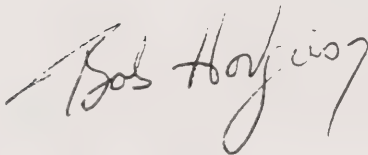
....\2

Transport Canada
Mr. Bruce Farrow
Project #3199
January 31, 1996
Page 2

If the above four points accurately reflect your position, could you please sign the bottom of this letter and fax a copy back to me at 905-823-8503, so that our files are complete. If this is not correct, could you please advise me in writing of your position. Thank you for your assistance and if you have any questions regarding this matter please do not hesitate to give me a call.

Yours truly;

ECOPLANS LIMITED



Bob Hodgins, BSc (Ag), MBA
Manager, Mississauga Office

I agree that this accurately reflects our position on this Project:

Signature, Transport Canada - Airports

Date

APPENDIX 17.2
PROVINCIAL AGENCIES

Agriculture, Food & Rural Affairs



Ministry of
Agriculture
and Food

Ministère de
l'Agriculture et
de l'Alimentation

LAND USE PLANNING BRANCH

322 Kent Street West
Lindsay, Ontario
K9V 2Z9
(705) 324-5432
Fax (705) 324-1638

January 31, 1996

Bob Hodgins
Ecoplans Ltd.
2655 North Sheridan Way
Mississauga, Ontario
L5K 2P8

Dear Mr. Hodgins:

Re: Study to address interim traffic congestion
Highway 407 at Highway 48

**NOTE STIX
FAX TRANSMITTAL MEM**

# of pages 1	
To	BOB HODGINS
Co.	
Dept.	
Fax #	905-823-8501
From	D. TOOMBS
Co.	OMAFRA
Phone #	
Fax #	

In reply to your request for comments outlined at the January 25, 1996 meeting regarding the above study, this ministry has the following comments.

The majority of the study area between Highway 48 and Brock Road is within non-agricultural designations of the Durham Region and York Region official plans. There is an agricultural area between Little Rouge Creek and West Duffins Creek. The technically preferred route of 407 is approximately 2.2 kilometres in length in this agricultural area.

This ministry would have no objection to the Ministry of Transportation's request for an exemption from the environmental assessment process for that portion of the study area between Highway #48 and Brock Road as long as the only considered alignment is the technically preferred route of proposed Highway 407.

If you have any questions or would like to discuss the matter further, please contact me at the above address.

Yours truly,

Dale Toombs
Land Use Specialist

cc: Sharon Johnston
Jeannie McNaughton, District Manager



Citizenship, Culture & Recreation



Ontario

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ONTARIO
irrésistible!

Ministry of
Tourism and
Recreation

Ministère du
Tourisme et
des Loisirs

700 Bay Street
8th Floor
Toronto, Ontario
M5G 1Z6
Telephone (416) 965-0286
Telecopier (416) 965-0772

700 rue Bay
8^e étage
Toronto (Ontario)
M5G 1Z6
Téléphone (416) 965-0286
Télécopieuse (416) 965-0772

September 11, 1991

Mr. I. K. Upjohn, M.G.I.P.
Principal Planner
Environmental Services, Transportation
Fenco Engineers Inc.
Atria North - Phase II
2235 Sheppard Avenue East
Willowdale, Ontario
M2J 5A6

Dear Mr. Upjohn:

Re: Highway 407/Transit Transportation Corridor
Highway 48 - Whitby/Oshawa Boundary Route
Planning and Environmental Assessment Study

Thank you for your letter and information of
August 26, 1991 regarding the above study.

My staff for the Durham Region have reviewed this
information and have no comments to make at this time.

However, we would appreciate being kept informed on
the progress of this study.

Yours sincerely,

Charles Bouskill
Regional Director

cc: Tom Adamchick
Executive Director

RECEIVED

SEP 16 1991

Route To:	
<i>1-40</i>	<i>4</i>
File	



Ministry
of
Transportation

Ministère
des
Transports

Planning and Design Section
Environmental Unit
Central Region
1201 Wilson Avenue
Atrium Tower, 5th Floor
Downsview, Ontario
M3M 1J8

Tel.: (416) 235-5547

October 31, 1991

Mr. Peter Carruthers
Environmental Assessment Coordinator
Heritage Programs Section
Ministry of Culture and Communications
2nd Floor, 77 Bloor Street West
Toronto, Ontario
M7A 2R9

Dear Mr. Carruthers:

Re: Highway 407/ Transit Corridor Route Planning and
Environmental Assessment Study, from Highway 48 to
Highway 35/115, W.P.'s 282-86-01 and 326-88-01

This is to confirm our conversation of 1991-10-30 regarding
your comments on the material received to date for the
above-noted project.

With regard to the Technical Reports, the level of data and
the methodology provided for the westerly half (Fenco) is
acceptable. This data was also presented to you at a
meeting with Ian Upjohn and Richard Unterman on 91-02-06.

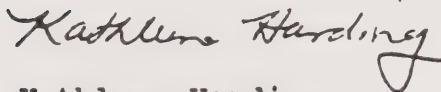
An increased level of detail is required for the easterly
half (Parker) to allow proper assessment of that report. As
you are now aware, additional data was collected and used
during route evaluation. Once reproduced, you will receive
a copy of this information.

MCC concurs with the methodology and results as related to the selection of a technically preferred route. From a strictly heritage perspective, however, the northerly route is generally preferable, i.e. less disruption to features/communities. MCC prefers that the cultural environment be given approximately 10 points out of 100 during these types of evaluations. Following our conversation, the weightings were confirmed to be eight and nine (varies with east/west), however if visual aesthetics and other community related indicators are considered the weighting actually becomes greater than 10.

MCC appreciates that additional data needs to be documented for the route planning phase and looks forward to reviewing updated reports as they become available. With regard to archaeology, most of the field work will occur during subsequent phases, such as Preliminary Design, and additional findings will be available for comment at that time.

If you have any comments in addition to the above, please feel free to contact me.

Yours truly



Kathleen Harding
Environmental Planner

kh/

cc: P. Reynolds
C. Lumley
F. Leech
R. Zaryski Jackson
G. Warrick
I. Upjohn, Fenco
R. Smith, C.C. Parker



Ontario

Ministry of
Culture and
Communications

Ministère de la
Culture et des
Communications

77 Bloor Street West
Toronto, Ontario
M7A 2R9

77 ouest, rue Bloor
Toronto, Ontario
M7A 2R9

Heritage Policy Branch
Development Plans Review Unit
Tel: (416) 314-7145
Fax: (416) 314-7790

Your File:

Our File:

October 7, 1992

Mr. Patrick Reynolds, Project Manager
Ministry of Transportation
Central Region
Transportation Planning Section
Atrium Tower, 3rd Floor
1201 Wilson Avenue
Downsview, Ontario
M3M 1J8

Dear Mr. Reynolds:

Re: Highway 407 Transit Transportation Corridor
Highway 48 to Highway 35/115
Route Planning/Environmental Assessment Study

Proposed Minor Alignment Shift in the Town of Markham

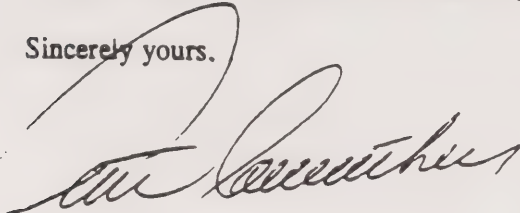
We have reviewed the proposed shift in the highway alignment from Segment S3 to Segment S3S, as described in September 8, 1992 correspondence and attachments from Fenco Inc. The available documentation clearly indicates that potential impacts on cultural heritage resources will be comparatively greater if the realignment is adopted as the preferred alternative.

With regard to built heritage, in our recent contact with the Town of Markham, we have not been able to identify exactly which "19th century 'ordinary' farmstead" is within the proposed S3S right of way. A number of buildings in the Tenth Line area appear in the new (1991) Markham Inventory of Heritage Buildings however **their significance has not yet been classified**. It appears, then, that contrary to Fenco's comparative analysis, the best information currently available indicates that the Town has not "verified" the relative heritage value of whichever farmstead is in the realigned right of way. We recommend that this value assessment be undertaken and documented in the ESR to be completed for this undertaking, together with an indication of what conservation strategy is to be adopted for the affected farmstead.

With regard to archaeological heritage, we note that contrary to Fenco's "Table #2 Summary Comparison", both of the identified archaeological sites "immediately adjacent" to the S3S southern boundary are classified as significant. This is confirmed on page 12 of the Archaeological Background Report found in the "Environmental And Technical Paper #4" prepared in January 1991 for this Study. The exact boundaries of archaeological sites AlGt-14 and AlGt-35 are not presently known. Because the sites are in immediate proximity to the realigned right of way, it is highly possible that they may be impacted by the highway's construction. Therefore, we recommend that sites AlGt-14 and AlGt-35 be included in the archaeological assessment to be undertaken for the approved right of way. Assessment of these two sites would be subject to Section 5.4 of the MCC-MTO Protocol For Dealing With Archaeological Concerns on Ministry of Transportation Undertakings.

Adoption of the above recommendations will satisfy our concerns for the increased threats to heritage resources resulting from the proposed realignments. Please feel free to contact either myself or James Yanchula of this Unit if you have any further questions about this matter.

Sincerely yours,



Peter Carruthers
Environmental Assessment Co-Ordinator

cc: Mr. Ian Upjohn,
Fenco Engineers Inc.

Mr. Regan Hutcheson,
Town of Markham

Cultural Programs Branch
Archaeology and Heritage Planning Unit
Tel: (416) 314-7146 Fax: (416) 314-7175

16 February 1996

R.C. Hodgins
Manager, Mississauga Office
Ecoplans Limited
2655 North Sheridan Way
Mississauga ON L5K 2P8

RE: Class Environmental Assessment, Proposed Right of Way for
Highway 407 from Highway 48 to Brock Road, Town of Markham,
Regional Municipality of York, and Town of Pickering, Regional
Municipality of Durham

A principal concern of this Ministry is the adverse effects that undertakings such as the above mentioned may have on cultural heritage resources. If a preferred alternative is determined to have the potential to have an impact on cultural heritage resources, then this office would recommend that a cultural heritage resource assessment be prepared as part of the Environmental Assessment. If any significant cultural heritage features are identified, then any negative impacts would have to be mitigated by either avoidance or documentation.

The Fenco Lavalin technical paper entitled Highway 407, Route Planning and Environmental Assessment Study, Highway 48 Easterly to Whitby-Oshawa Boundary, WP 282-86-01: Environmental Technical Paper #4, Cultural Landscape and Built Environment Features and Archaeological Resources, constitutes a good preliminary inventory of the cultural heritage resources along the corridor.

In addition to the Fenco Lavalin study, the area of the proposed international airport in Markham and north Pickering received extensive archaeological assessment in the 1970s. A comprehensive and detailed cultural heritage resource assessment was done for the Seaton lands in the early 1990s, including inventory and evaluation of archaeological resources, built heritage, cultural heritage landscapes and natural heritage. Both these studies should be utilised in the current cultural heritage resource assessment.

Additional research on each heritage property faced with potential negative impacts due to the route selected will be necessary in

order to evaluate its unique significance and the appropriate means for its mitigation. In order to ensure the accuracy and currency of the inventory, the local LACACs (Local Architectural Conservation Advisory Committee) for both the Town of Markham and the Town of Pickering should be consulted regarding their concerns for impacts to cultural landscapes and built heritage resources. Under the Ontario Heritage Act, the local LACAC is the advisory body for recommendations to a municipal Council concerning the significance of and mitigative approaches to built heritage.

This Ministry has recently developed Heritage Conservation Principles for Landuse Planning (see attached). These guidelines provide advice on the most appropriate means to approaching the conservation of heritage features.

Given the proposed accelerated schedule, it is recommended that properties containing heritage features (ie. buildings and landscapes) identified as significant be given priority for access. Early access to the feature will provide the necessary time for proper research and documentation, as well as the time for any mitigative efforts to take place properly. This will prevent costly time delays. It will also provide a greater opportunity for design changes that allow avoidance, and allow a greater opportunity to make design changes that maintain the context and integrity of various features and characteristics of both buildings and cultural landscapes.

Within the technical paper referred to above, the Museum of Indian Archaeology identified 39 known archaeological sites within a study area extending from Highway 48 to the Whitby-Oshawa townline. Archaeological assessment by Mayer Heritage Consultants in 1993 identified several sites in the area immediately west of the Pickering-Markham townline, and identified that area as having archaeological potential. Based on the proposed route depicted in the information package of January 25, 1996, there are several significant archaeological sites that may be impacted by the corridor and that are likely to require extensive mitigation efforts, including: AlGs-5, a Late Woodland village immediately southwest of Brougham; AlGs-27, a large Laurentian Archaic site immediately southeast of Brougham; AlGt-14, a Late Woodland village in Markham; and, AlGt-35, a Late Woodland village in Markham. The Rolph Ossuary (a prehistoric burial site) may also lie within the corridor. If the corridor passes within close proximity to any cemeteries dating to the nineteenth century, there is also the risk of impacts to unmarked burials.

It should be emphasized that most of the corridor has received no archaeological assessment. Given the nature of archaeological resources, it is necessary to determine the need for archaeological

assessment through an evaluation of potential. As recommended in the Fenco Lavalin report, most of the proposed corridor has sufficient potential to require an archaeological assessment. The potential within this area is sufficiently high that it is likely that previously undocumented archaeological sites will be found that are sufficiently significant to require mitigation through either avoidance or excavation.

Mitigation may be a time-consuming process (especially for Late Woodland villages), and given the accelerated schedule proposed for this project, it is strongly recommended that a licensed archaeological consultant be retained as soon as possible. A list of such consultants is attached. These consultants must adhere to the standards for archaeological assessment described in this Ministry's Archaeological Assessment Technical Guidelines. Putting a consultant in the field early in the process will allow the early identification of archaeological sites requiring mitigation and prevent unnecessary conflicts between the conservation efforts for archaeological resources and the construction schedule. Early identification may allow avoidance of archaeological sites (rather than excavation) and will certainly reduce costs associated with delays and rushed mitigation efforts.

This Ministry hopes to continue to be closely involved in this project, and our staff are available to provide any advice necessary.

Should you wish to discuss this matter further, please do not hesitate to contact me.

Sincerely,



Malcolm Horne
Heritage Planner

- c. Peter Carruthers, Environmental Assessment Co-ordinator,
Archaeology and Heritage Planning Unit, MCZCR
Fred Cane, Conservation Officer, Heritage Properties Program,
MCZCR

HERITAGE CONSERVATION PRINCIPLES FOR LANDUSE PLANNING

The Province of Ontario has developed new land use planning policies that direct municipalities to have regard for built heritage resources, cultural heritage landscapes and archaeological resources. Increasingly, LACACs may be requested to advise planning departments and municipal councils on land use planning issues as they affect local heritage resources. The following principles were developed to provide guidance to LACACs as their involvement with local land use planning increases.

TIMELINESS

It is important to identify heritage conservation issues at the beginning of the planning process and to make continuous reference to heritage conservation issues throughout the decision making process.

VALUE / SIGNIFICANCE

Respect for the significance of the resource must be taken into consideration at every step in the planning and decision-making process.

Respect the cultural values of the community for whom the resource has significance. Evaluation of significance should reflect consensus among community members with an interest in the preservation, use and development of cultural heritage.

Evaluation must be based on proper research. Evaluation clarifies where significance or value lies in cultural heritage and how that significance is expressed.

INCLUSIVENESS

Look at the community as a whole before you look at individual parts. Consider both tangible heritage resources such as structures and artifacts and intangible heritage resources such as cultural expressions, stories, songs etc.

In a community, a heritage resource is part of a whole system which includes the natural environment and human activities. The activities of one part may affect the other parts. Have concern for maintaining the integrity of the whole system.

Encourage approaches to planning that are sustainable, that minimize negative long-term impacts on the social, cultural, economic and physical aspects of cultural heritage resources.

RESPECT FOR CONTEXT

The surroundings or setting of a cultural heritage resource often contribute to its significance and vice versa. Where significance is linked to the *contextual* value of the resource, try to preserve the context.

Try to maintain the same use for a heritage resource, or if this is not possible, find a compatible new use that does not demand too much change to the resource's physical fabric.

RETENTION

The decision making process should always presume in favour of retaining the heritage resource. The only exception to this rule is when there is a demonstrated public benefit of greater importance than the protection of the heritage resource.

The significance, type, use and condition of a resource should be considered as part of the decision making process.

Only allow changes that will offer the least harm to the resource or will provide the greatest potential to enhance its significance and appreciation.

Where negative impacts are unavoidable, effective mitigation must be applied including reusing and making sympathetic alterations, reconstruction, moving to an appropriate setting, commemoration on site or elsewhere, or recording the resource before any negative changes are made.

CAUTION

Avoid decisions that will damage or harm the fabric of cultural heritage resources and their settings. Use approaches that offer the least risk to the fabric of the resource. Consider sympathetic alterations or reversible changes to it.

Give priority to measures that improve conditions for long-term conservation: focus on maintenance of parts, setting, function or use.

Ensure that approaches proposed for conservation have been proved reliable and effective and that they constitute good practice.

PUBLIC BENEFIT

To understand and appreciate cultural resources, the public should be provided with accurate interpretation of the resource, through information that effectively communicates the importance and value of the resource.

**ECOPLANS LIMITED****ENVIRONMENTAL PLANNERS AND CONSULTING ECOLOGISTS****MEMORANDUM**

TO: File 95-1766

FROM: Bob Hodgins

DATE: January 29, 1996

C.C. Denise Morneau, Pat Reynolds, Leslie Scott

SUBJECT: TELEPHONE CONVERSATION WITH MR. GREG STEWART (MCZCR)

Today I spoke with Greg Stewart of the Barrie office of the Ministry of Citizenship, Culture and Recreation. He is the representative for the York/Simcoe Area. Mr. Stewart indicated that the recreational side of their Ministry does not need to be involved in the Highway 407 study, unless the project will affect a municipal recreational facility for which MCZCR may have provided funding. I told him that we would contact them if we are going to affect such a facility, otherwise we would not involve them in the rest of the study. He agreed with this approach.

BOB - IN CASES WHERE WE HAVE NO COMMENT FROM A CULTURE OR RECREATION PERSPECTIVE, THE MINISTRY WILL PROVIDE COMMENTS ON ANY POTENTIAL IMPACT ON HERITAGE RESOURCES, FOR REVIEW / COMMENT ON POTENTIAL IMPACTS, PLEASE CONTACT: MANAGER - ARCHAEOLOGY AND HERITAGE PLANNING UNIT - 2ND FLOOR - 77 BLOOR ST. W. TORONTO M7A 2

I agree that this accurately reflects our position on this Project:

Signature,

Ministry of Citizenship, Culture and Recreation

Date



PLANNING & DEVELOPMENT COMMISSION
STRATEGIC & POLICY PLANNING
DEVELOPMENT & DESIGN

April 23, 1996

W00 3199-96
C.C.D.B. HODGINS.

Ms. Denise Morneau, P. Eng.
Ministry of Transportation
1201 Wilson Avenue, 3rd Floor, Atrium Tower
Downsview, Ontario
M3M 1J8

APR 24 1996

Dear Ms. Morneau:

**RE: Study to Address Traffic and Environmental Issues Associated with the
Opening of Highway 407 at Markham Road**

Heritage Markham, the Town of Markham's heritage advisory committee has asked that I contact you to ensure that the Committee is kept informed of this current study. The Committee is interested in two subject areas:

- 1) the impact of the interchange of Hwy 407 at Hwy 48 (Markham Road) given this is the gateway to the Markham Village Heritage Conservation District;
- 2) the impact of Hwy 407 on heritage resources from Hwy 48 (Markham Road) to the Markham Town boundary.

Any correspondence for Heritage Markham can be sent to the Town's Heritage Section in care of **Mr. Regan Hutcheson, Senior Planner- Heritage and Conservation**

**Heritage Section
Corporation of the Town of Markham
101 Town Centre Blvd, Anthony Roman Centre
Markham, ON L3R 9W3**

If you have any further questions, please contact the undersigned in the Heritage Section at (905)477-7000, extension 208.

Sincerely,

Regan Hutcheson, MCIP, RPP
Senior Planner - Heritage and Conservation

C. Mr. John Sutherns, McCormick Rankin
e:\hrtgdata\subject\hwy407\lmorneau.doc :rh

Town of Markham Anthony Roman Centre
(905) 477-7000 (905) 475-4861

101 Town Centre Boulevard, Markham, Ontario L3R 9W3
Fax (905) 479-7768 / 479-7773



Community and Social Services



Ministry of
Community and
Social Services

Ministère des
Services sociaux
et communautaires

34 Simcoe Street
P.O. Box 910
Barrie, Ontario
L4M 4Y6
(705) 737-1311

34, rue Simcoe
Case postale 910
Barrie (Ontario)
L4M 4Y6
(705) 737-1311

June 14, 1989

Mr. Patrick J. Reynolds
Senior Transportation Planner
Transportation Planning Section
M.T.O. Central Region
5000 Yonge Street
Willowdale, Ontario
M2N 6E9



Dear Mr. Reynolds:

RE: Route Planning/Environmental Assessment
Study for Proposed Highway 407 from Hwy 48
in Markham Easterly to Hwy 36/115 in the
Town of Newcastle

Please be advised that we do not have comments nor concerns
regarding the above-named project.

Thank you for sharing this material with us, however, we do
not require any further information regarding this project.

Yours sincerely,

Margaret Galloway
Area Manager
Barrie Area

/ap

cc: B. Honeyford



Ontario

Ministry of
Community and
Social Services

Ministère des
Services sociaux
et communautaires

(705) 742-9292

60 Hunter Street East
Peterborough, Ontario
K9H 1G5

May 22, 1990

Mr. P. Reynolds
Senior Transportation Planner
Transportation Planning Office
3rd Floor, Atrium Tower
1201 Wilson Avenue
Downsview, Ontario
M3M 1J8

Dear Mr. Reynolds:

Re: Highway 407 Route Planning, -
Preliminary Design & Environmental
Assessment Study
From Highway 48 to Highway 35/115

This is in response to your request for comments regarding alternative proposed routes for Highway 407, from Highway 48 to Highway 35/115.

The only comment that I could suggest at this time, is that the preferred route would be one that would facilitate access for the planned community of SEATON to Metropolitan Toronto. It would also be advisable that this route would provide easy access to the residents of the northern section of Oshawa-Whitby to this highway.

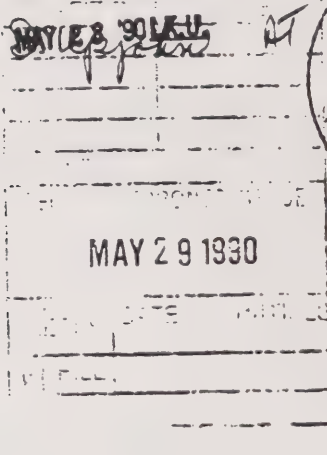
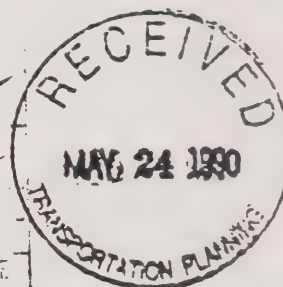
For your consideration: Thank you for considering the Ministry of Community and Social Services in your proposals. The Peterborough Area Office would have no other comments to offer regarding this endeavour.

Yours truly,

Lynn Lowry
Program Support Manager

LL:mw

cc: F. Purificati
A. Honeyford





Ministry of
Community and
Social Services

Ministère des
Services sociaux
et communautaires

34 Simcoe Street
Barrie, Ontario
L4N 6T4
(705) 737-1311

34, rue Simcoe
Barrie (Ontario)
L4N 6T4
(705) 737-1311

December 24, 1991

Mr. Patrick Reynolds
Project Manager
Transportation Planning Section
Ministry of Transportation
3rd Floor, Atrium Tower
1201 Wilson Avenue
Downsview, Ontario
M3M 1J8

Dear Mr. Reynolds:

RE: Highway 407/Transit Transportation Corridor
Route Planning and Environmental Assessment Study
Oshawa/Whitby Boundary to Highway 35/115
WP 326-88-01

Please be advised that we do not have any comments nor concerns regarding the above-named project.

Thank you for sharing this material with us, however, we do not require any further information regarding this project.

Yours sincerely,

Sheila Masters
Area Manager
Barrie Area

/ap

cc: M. Gallow
D.W. Coutts

P.S. Please update your records and replace the name, Mr. J.M. Ennis with Ms. Margaret Gallow, Regional Director.



Education & Training



Ontario

STK JUL 6 '89

Ministry
of
Education

Ministère
de
l'Éducation

Floor
Mowat Block
Queen's Park
Toronto, Ontario
M7A 1L2

etage
Edifice Mowat
Queen's Park
Toronto (Ontario)
M7A 1L2

June 19, 1989

Mr. Patrick J. Reynolds
Senior Transportation Planner
Transportation Planning Section
M.T.O. Central Region
5000 Yonge Street
Willowdale, Ontario
M2N 6E9

Re: Route Planning/Environmental Assessment Study for the
Proposed Highway 407 from Hwy. 48 easterly to Hwy.
35/115

Dear Mr. Reynolds:

Thank you for sending to this office the material on the above captioned EA study. We do not have any comments to make at this time other than to say details and proceeding of this study should be made available to local school boards which may be affected by this proposal.

If the school boards have a problem with the study which they cannot resolve, then this ministry will endeavour to assist them in the problem resolution. Otherwise, we need not remain on the review team but would appreciate being left on the mailing list for information only. Please see attached list for school boards to be contacted.

Yours sincerely,

S. Mitchell

Steven Mitchell
Architect

c.c. R. Trbovich
T. Grostenboer



List of School Boards

1. York Region Board of Education
60 Wellington St. West
Aurora, Ontario
L4G 3H2
Attn: R.A. Cressman
Director of Education and Secretary-Treasurer
2. York Region Roman Catholic Separate School Board
21 Dunlop St.
Richmond Hill, Ontario
L4C 2M5
Attn: F.S. Bobesich
Director of Education and Secretary-Treasurer
3. Durham Board of Education
555 Rossland Road West
Oshawa, Ontario
L1J 3H3
Attn: B.W. Mather
Director of Education and Secretary
4. Durham Region Roman Catholic Separate School Board
650 Rossland Road West
Oshawa, Ontario
L1T 7C4
Attn: Dr. E. J. Lagroix
Director of Education and Secretary-Treasurer
5. Northumberland and Newcastle Board of Education
834 D'Arcy Street
Cobourg, Ontario
K9A 4L2
Attn: G. W. Tushingham
Director of Education and Secretary
6. Peterborough Victoria Northumberland and Newcastle
Roman Catholic Separate School Board
459 Reid Street
Peterborough, Ontario
K9H 4G7
Attn: P. L. Roach
Director of Education and Secretary-Treasurer



Ministry of Transportation
Ministère des Transports

Planning and Design
Environmental Unit
Central Region
1201 Wilson Avenue
Atrium Tower, 5th Floor
Downsview, Ontario
M3M 1J8

Telephone: 235-5545

June 21, 1989

Mr. E. Tannis
University Affairs Officer &
Environmental Assessments Review Coordinator
Capital and Operating Grants
University Relations Branch
Ministry of Colleges and Universities
9th Floor, Mowat Block
900 Bay Street
Toronto, Ontario M7A 1L2

Dear Sir:

Re: Highway 407 Route Planning & Preliminary Design (E.A.) Study
W.P. 282-86-01 Highway 48 to Oshawa/Whitby Boundary
W.P. 326-88-01 Oshawa/Whitby Boundary to Highway 115
MTO Districts 4 & 6

Thank you for your telephone call of June 13, 1989. I understand from our conversation that your Ministry does not wish to be involved further in any form for any aspects of the pre-submission consultation phase of the above-noted study. As such, your name will be removed from our contact list.

As requested, I am copying this letter to the Ministry of the Environment's Environmental Assessment Branch. It is my understanding from our conversation that MCU does not wish to be involved in any pre-submission consultation for EA studies conducted by this Ministry, or any other agencies, and that MOE has been requested to withdraw MCU from its list of pre-submission review agencies.

As we discussed, the only college or university which might be associated in any way with the study area is Centennial College in Scarborough. They will be advised of the study and requested to identify any interests that they may have in the study (which does not extend into Scarborough, per se).

L. J. J. ENGINEERS INC.	
DATE	NOTED
A. Menckler	
RECEIVED OFFICE	
JUL 6 1989	
REPORT DATE	INITIALS
FILE	
C.C.	
9-1001	

Thank you for your assistance with this study.

Yours truly,

A handwritten signature in dark ink, appearing to read "Jay Nuttall", written over a horizontal line.

Jay Nuttall
Senior Environmental Planner

CJN/1a

cc: P. Reynolds
A. Minchev/I. Upjohn (Fenco)
D. Coutts (C.C. Parker)/P. Prier (E.S.P.)
N. Wood (MOE E.A. Branch)
R. Hodgins/J. Dougall
Regional E.U. Supervisors

01/31/96 13:50 ☎905 823 8503

McCORMICK RANKIN

002/002



2655 North Sheridan Way
Mississauga, Ontario
L5K 2P8
Phone: (905) 823-4988
Fax: (905) 823-8503

RECEIVED

JAN 31 1996

January 30, 1996

Ministry of Education & Training
Capital Support Section
21st Floor, Mowat Block
900 Bay St.
Queen's Park
Toronto, Ontario
M7A 1L2

School Capital Program

Attn: Mr. Theo Grootenboer
Manager

Dear Mr. Grootenboer:

RE: HIGHWAY 407 EXTENSION - ENVIRONMENTAL ASSESSMENT

A couple of weeks ago, I spoke with you regarding the need to involve your Ministry in the above study. At that time you indicated that you did not need to be involved in the study, and that we should deal with the local school boards. We are proceeding on this basis and will not be involving you any further. If this accurately reflects your position, could you please sign the bottom of this letter and fax a copy back to me at 905-823-8503, so that our files are complete. If this is not correct, could you please advise me in writing of your position. Thank you for your assistance and if you have any questions regarding this matter please do not hesitate to give me a call.

Yours truly;

ECOPLANS LIMITED

A handwritten signature in cursive script that reads "Bob Hodgins".

Bob Hodgins, BSc (Ag), MBA
Manager, Mississauga Office

I agree that this accurately reflects our
position on this Project:

A handwritten signature in cursive script, likely belonging to a representative of the Ministry of Education & Training.

Signature, Ministry of Education & Training

A handwritten date "Jan 31 1996" written in cursive script.

Date

Environment & Energy



Ontario

Ministry of Energy
Ministère de l'Énergie

Queen's Park
Toronto, Ontario
M7A 2B7
Telex 06217880
965-1276

Queen's Park
Toronto (Ontario)
M7A 2B7
Telex 06217880
965-1276

May 10, 1990

Mr. Patrick J. Reynolds
Senior Transportation Planner
Transportation Planning Section
Ministry of Transportation - Central Region
5000 Yonge Street
Willowdale, Ontario
M2N 6E9



Dear Mr. Reynolds:

Re: Highway 407 Environmental Assessment

Thank you for your recent letter announcing the commencement of studies to determine the location and right-of-way requirements for the proposed Highway 407 from Highway 48 in Markham east to Highway 35/115 in the Town of Newcastle.

As this project is unlikely to have any significant energy impact, the Ministry of Energy does not wish to participate in the study and Environmental Assessment process.

Thank you for providing us with the opportunity to participate.

Yours sincerely,

John Lang
Advisor, Electricity
Liaison and Planning Branch

cc: Cliff Jutlah
Manager, Electricity Section



Ontario

Ministry of Energy
Ministère de l'Énergie

Queen's Park
Toronto, Ontario
M7A 2B7
Telex-06217880
900-
327-1467

Queen's Park
Toronto (Ontario)
M7A 2B7
Télex-06217880
900-

November 20, 1990

Mr. Tyrone Gan, P. Eng.
Manager
Transportation Planning
Proctor and Redfern Limited
45 Green Belt Drive
Don Mills, Ontario
M3C 3K3

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NOV 28 1990

PROCTOR & REDFERN
LIMITED

Dear Mr. Gan:

RE: Route Planning/Environmental Assessment Study
Freeway Link from Highway 401 to Highway 407
(Pickering/Ajax/Whitby Freeway Link)

Thank you for your recent letter concerning the
Environmental Assessment Study for the above project.

I have reviewed your brochure introducing the study. The
Ministry of Energy would like to know if provision will be
made in the proposed freeway link for a traffic lane
dedicated to high occupancy and ride-sharing vehicles.
I understand that such a lane was proposed in the initial
plans for Highway 407 itself. Our Ministry would also like
a special lane included in any planned freeway links to the
407. I would appreciate if you would advise me of any
relevant plans, at the following address:

14th Floor
56 Wellesley Street West
Toronto, Ontario
M7A 2B7.

Thank you for giving us the opportunity to participate.

Yours truly,

Jill Pritchard-Scott

Jill Pritchard-Scott
Environmental Assessment Coordinator

cc: L. Moore
J. Hutchison



Ontario

Ministry
of
Transportation

Ministère
des
Transports

(416) 235-5481



Transportation Planning Office
3rd Floor, Atrium Tower,
1201 Wilson Avenue,
Downsview, Ontario
M3M 1J8

January 3, 1991

Ministry of Energy
14th Floor
56 Wellesley Street West
Toronto, Ontario
M7A 2B7

Attention: Ms. Jill Pritchard-Scott
Environmental Assessment Co-ordinator

RE: Your inquiry on provisions for high occupancy and
ride sharing vehicles in the Freeway Link studies
as well as Highway 407 itself.

Dear Ms. Pritchard-Scott:

I am responding to you on behalf of Mr. T. Gan whom is undertaking, as a consultant on behalf of the Ministry, one of the "Freeway Link" projects.

I thank you for your letter dated November 20, 1990 with regards to your Ministry's concerns on the inclusion of High Occupancy Vehicle (H.O.V.) lanes on our "Link" projects as well as Highway 407.

Currently, the Ministry is formulating policy with regards to the provision of H.O.V. lanes on our freeway network.

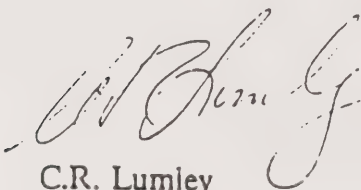
It should be noted that the main rationale for these planning studies is to protect/reserve transportation corridors for the future, in that these "Link" facilities will most probably not be constructed for at least 10 to 15 years.

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JAN 3 1991	
	Int.

As you are probably aware this Ministry is, in the Highway 407 corridor, protecting within the planned right-of-way for major transit. The "Link" projects do not have the same protection element, i.e. additional right-of-way due to the fact that they are in close proximity, 10 - 12 kms to the major east/west transit corridors, i.e. GO Line adjacent to Highway 401 and the above-mentioned Highway 407 transit corridor. It is anticipated that the local transit service will provide the necessary "feed" to these major inter-regional systems.

We will certainly keep you informed as to the policy issue of providing the flexibility of an H.O.V. lane on our Freeway system and thank you again for your comments.

If you require any further information on these projects, do not hesitate to call.
Sincerely,



C.R. Lumley
Area Manager

CRL/tk

cc: D. Mackie, Transportation Planning Section, M.T.O.
P. Reynolds, Transportation Planning Section, M.T.O.
D. Ivanauskas, Environmental Unit, M.T.O.
T. Gan, Proctor & Redfern



Ontario

Ministry of Energy
Ministère de l'Énergie

Queen's Park Toronto, Ontario M7A 2B7 Telex-06217880 965-	Queen's Park Toronto (Ontario) M7A 2B7 Télex-06217880 965-
---	--

Fax: (416) 327-1511
Phone: (416) 327-1467

3 December 1991

Mr. Patrick Reynolds
Project Manager
Transportation Planning Section
Ministry of Transportation
3rd Floor, Atrium Tower
1201 Wilson Avenue
Downsview, Ontario
M3M 1J8

Dear Mr. Reynolds:

RE: Highway 407/Transit Transportation Corridor
Route Planning and Environmental Assessment Study
Oshawa/Whitby Boundary to Highway 35/115
WP 326-88-01

Thank you for your recent correspondence about the technically preferred route for the Oshawa to Highway 35 section of the planned Highway 407.

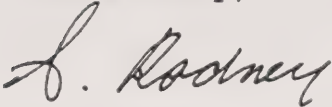
The Ministry of Energy finds the technically preferred route acceptable. However, since we have just joined this study, we have some questions:

1. What kind of mass transit is planned for the corridor indicated on the map? Will it be GO train or GO bus?
2. When might the transit be in place? Our Ministry recommends that development of new mass transit be given priority over new highway work. We would therefore encourage the development of the GO line before any work is done on Highway 407.



3. We assume, based on earlier correspondence with your ministry about the 407-401 "links", that the Highway 407 corridor will be protected for high occupancy vehicle lanes, to facilitate buses and ride sharing.

Yours truly,

A handwritten signature in cursive script, appearing to read "L. Rodney".A small handwritten mark or set of initials, possibly "JPS", located to the left of the typed name.

Jill Pritchard-Scott
Environmental Assessment Coordinator



Ontario

Ministry of Transportation
Ministère des Transports

Tel: (416) 235-5481
Fax: (416) 235-4382



Central Region
Transportation Planning Section
3rd Floor, Atrium Tower
1201 Wilson Avenue
Downsview, Ontario
M3M 1J8

December 10, 1991

Ms. Jill Pritchard-Scott
Environmental Assessment Co-ordinator
Energy Management Branch
Ministry of Energy
14th Floor, 56 Wellesley Street West
Toronto, Ontario
M7A 2B7

Dear Ms. Pritchard-Scott:

**RE: Highway 407/Transit Transportation Corridor
Route Planning and Environmental Assessment Study
Oshawa/Whitby Boundary to Highway 35/115
W.P. 326-88-01**

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ATM	47

Thank you for your letter of December 3, 1991 with regards to your ministry's comments and acceptance of the technically preferred route for the above noted study.

With regards to your questions regarding the study and in particular the transit component, the following is applicable.

- (a) At the present time, the technology regarding the type of transit that will be operating in this corridor is unknown. However, we are proposing the protection of the "GO Train System", as any other technology will fit within these parameters and would have less impacts.
- (b) As you are no doubt aware, the Ministry, until we have received environmental approval, cannot program any works, be it transit or road. Once having received approval, our agency could then be in a position to prioritize the transportation system which could provide the largest benefit to the populace. Your ministry's position regarding the development of the transit prior to the road improvements is noted.

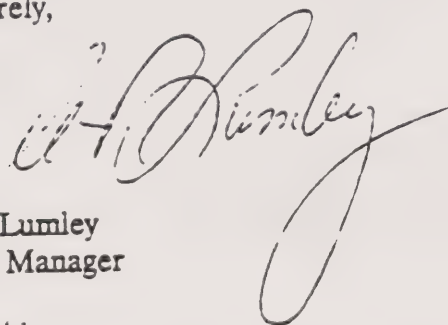
It should be noted that a separate environmental assessment will be required for the approval of the transit technology prior to the implementation.

- (c) As noted in previous statements, the Ministry is currently formulating policy with regards to the utilization of high occupancy vehicle lanes on all major provincial facilities.

Once the above noted policy is available, each application would have to be reviewed to ensure the compatibility. I would suggest that if you require any additional information on this subject, please contact Mr. Wayne McEachern in our Municipal Transportation Policy Office whom is looking after the above noted policy aspects.

I thank you again for your acceptance letter and if we can be of further assistance to you, do not hesitate to call.

Sincerely,



C.R. Lumley
Area Manager

CRL/tk

cc: D. Garner
P. Reynolds
K. Harding
D. Mackie
W. McEachern
D. Coutts, PARKER
A. Minchev, FENCO



Ministry
of the
Environment

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MAR 22 1990
MAR 23 1990

CENTRAL REGION
PLANNING & DESIGN

APPROVALS BRANCH

250 Davisville Avenue
Toronto, Ontario
M4S 1H2

250, avenue Davisville
Toronto (Ontario)
M4S 1H2

440-3591

3rd Floor

March 20, 1990

Mr. A. Jay Nuttall
Senior Environmental Planner
Environmental Unit
Ministry of Transportation
5th Floor, Atrium Tower
1201 Wilson Avenue
Downsview, Ontario
M3M 1J8

Dear Sir:

RE: HIGHWAY #407
ROUTE PLANNING AND PRELIMINARY DESIGN STUDY
TRANSIT ASSUMPTIONS FOR NOISE ANALYSIS PURPOSES
PRE-SUBMISSION CONSULTATION
OUR FILE: 11-04-08

A review of the Transit Assumptions for the Route Location and Preliminary Design Studies for Highway 407 was completed and the following comments are offered.

In addition to the assumptions contained in your letter of February 23, 1990:

- (1) Whistle noise, where applicable, should be included as part of the noise generated by the rail transit facility.
- (2) The background sound levels used in the analysis of the noise impacts from the freeway and the rail transit facility should exclude existing aircraft and rail traffic noise.
- (3) To determine the "worst-case" impacts, the sound levels from the freeway and rail transit facility should be assessed over the 18-hour period assumed for the rail transit operations. The descriptor L_{eq} (18h) should be used in the analysis of these sound levels.

Note: According to standard practice, the sound levels, L_{eq} , generated by freeway traffic are assumed to be constant over a 24-hour period.

- (4) The combined sound levels generated by the freeway and rail transit facility should be subject to the criteria contained in the MOE/MTO "Noise Protocol" for Provincial Highways Environmental Assessments, dated February 1986.

Yours truly,

R. Krawczyniuk

R. Krawczyniuk
Project Analyst, Acoustics

RK/hw

cc: L.G. Kende
M. Sheppard



Ontario

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of the
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Ministère
de
l'Environnement

APPROVALS BRANCH

250 Davisville Avenue
Toronto, Ontario
M4S 1H2

250, avenue Davisville
Toronto (Ontario)
M4S 1H2

440-3591

3rd Floor

March 20, 1990

Mr. A. Jay Nuttall
Senior Environmental Planner
Environmental Unit
Ministry of Transportation
5th Floor, Atrium Tower
1201 Wilson Avenue
Downsview, Ontario
M3M 1J8

Dear Sir:

RE: HIGHWAY #407
EVALUATION CRITERIA FOR ROUTE PLANNING
PRE-SUBMISSION CONSULTATION
OUR FILE: 11-04-08

This office has reviewed the indicators proposed by your Ministry for the evaluation of the merits of the various route alternatives.

Although we have no objection to the use of the indicator which takes into account the number of noise sensitive receivers experiencing changes in sound levels, we do object to the indicator which considers only those receivers which will experience future sound levels greater than 55 dBA. The use of this indicator would exclude from the evaluation process, all receivers which may experience relatively large noise impacts (5-10 dB) while still being subject to future sound levels less than 55 dBA. With regard to the above, the MOE/MTO "Noise Protocol" for Provincial Highways Environmental Assessments, February 1986 states that where noise impacts will exceed 5 dB, the proponent will attempt to mitigate the sound levels to as close to or below the higher of 55 dBA or the pre-existing ambient sound level. In effect, the "Noise Protocol" states that, where feasible, the proponent should attempt to achieve pre-existing ambient conditions at highly impacted locations.

Wording similar to the following should be used to indicate the above-noted requirement.

"Noise sensitive receivers experiencing changes (+/-) in sound levels (5 dB ranges) over pre-existing conditions as well as the future sound levels (ranges of 5 dB) experienced by these receivers."

To facilitate the review process, a summary Table should be included in the EA for each route alternative. The Table should show the future sound levels (in ranges of 5 dB). Within each sound level range, the Table should also indicate the number of noise sensitive receivers which will experience changes (+/-) in sound levels (5 dB ranges) over pre-existing conditions. Note: The changes in sound levels at noise sensitive receivers other than homes; e.g., institutions, community recreational areas, etc. should be given adequate consideration in the selection of the most acceptable route.

Yours truly,

R. Krawczyniuk

R. Krawczyniuk
Project Analyst, Acoustics

RK/hw

cc: L.G. Kende
M. Sheppard



Planning and Design
Environmental Unit
Central Region
1201 Wilson Avenue
Atrium Tower, 5th Floor
Downsview, Ontario
M3M 1J8

Tel. # (416) 235-5547

July 10, 1990

Mr. L. Kende
Supervisor
Noise Assessment & Systems Support
Land Use Planning & Noise Assessment
Section
Ministry of the Environment
250 Davisville Avenue
3rd Floor
Toronto, Ontario
M4S 1H2

JUL 23 1990
[Signature]

Attention: Mr. R. Krawczyniuk
Project Analyst, Acoustics

Dear Sirs:

Re: Highway 407, Pre-Submission Consultation
Route Planning & Preliminary Design Study
W.P. 282-86-01 Highway 48 to Oshawa/Whitby Boundary
W.P. 326-86-01, Oshawa/Whitby Boundary to
Highway 35/115. Your File: 11-04-08

This is in response to your March 20, 1990 letters to Mr. A. Jay Nuttall regarding (i) Transit assumptions for noise analysis purposes and (ii) Evaluation criteria for route planning. With regard to your concerns listed in the letters, please note the following:

(i) **Transit Assumptions for Noise Analysis Purposes:**

- 1) As per your request, whistle noise, where applicable, will be included as part of the noise generated by the rail transit facility. Heavy rail passenger transit, the assumed mode for noise analyses purposes, requires as a warning device the

use of bells and horns as a train enters a station and bells only as the train leaves. It is my understanding that horns may be used in place of whistle noise in the CMHC model. There will not be any at-grade crossings, and therefore the warning signals will be incorporated at stations only, assumed to be at each interchange location.

- 2) The MTO position with regard to background sound levels from aircraft and rail traffic noise is that all major noise sources form part of the ambient, and therefore must be included. Your comment requesting that air and rail noise be excluded from the ambient should not cause any problem for this study, however, as no railways or airports currently pass through the study area. Should conditions change, your office will be contacted.
- 3) You requested that the sound levels from the freeway and rail transit facility be assessed over the 18-hour period assumed for the rail transit operations, using the Leq (18h) description. Our intent is to use Leq (24h) to assess freeway noise and Leq (18h) to assess transit noise. These will be logarithmically added to determine the combined impact.
- 4) We are in agreement with your statement that the combined sound levels generated by the freeway and rail transit facility should be subject to the criteria contained in the MOE/MTO "Noise Protocol" for Provincial Highways Environmental Assessment (February 1986).

(ii) **Evaluation Criteria for Route Planning**

The indicators which will be used during the evaluation process take into account both receivers which will experience future sound levels greater than 55 dBA and/or noise impacts exceeding 5 dBA.

The summary tables requested for each route alternative are part of the normal process used in the evaluation process. These will be included in the EA Report.

I trust that the above will satisfy your comments of March 20, 1990, however we are requesting conformation of this. Your comments would be appreciated by July 31, 1990.

Thank you in advance for your assistance in this matter. Should you require further information or have any questions, please call.

Yours truly,



Kathleen Harding
Environmental Planner

KH:dd

c.c. G. Casonato (MOE Central Region)
 M. Sheppard (MOE Land Use Planning)
 P. Reynolds
 C. Lumley
 H. A. McNeely
 C. Southey
 J. Dougall
 A. Minchev/I. Upjohn (Fenco)
 D. Coutts/R. Smith (Parker)
 P. Prier (ESP)
 J. Coulter

July 10, 1990

Mr. D. Guscott,
Director, Central Region
Operations Division
Ministry of the Environment,
7 Overlea Boulevard, 4th Floor
Toronto, Ontario
M4H 1A8

FENCO ENGINEERS INC.
ATRIA NORTH - PHASE II
2235 SHEPPARD AVE. EAST
WILLOWDALE, ONTARIO
CANADA M2J 5A6
TEL: (416) 756-1333
FAX: (416) 756-4998
TELEX: 06-986781
CABLE: LAVALIN TOR

Attention: Mr. R. Shaw

Dear Mr. Shaw:

HIGHWAY 407 - HIGHWAY 48 - WHITEBY/OSHAWA BOUNDARY
ROUTE PLANNING AND ENVIRONMENTAL ASSESSMENT STUDY

On April 10, 1990 the Ministry of the Environment's Central Region Operations Division was provided with an information package containing the following material for the subject study:

- 1) Technical papers documenting the initial collection of data for elements pertaining to MDE's mandate
- 2) Route alternatives under consideration
- 3) Factors to be used in the analysis and evaluation of the route alternatives

A response to the cited material was requested by May 5, 1990. A subsequent telephone follow-up was conducted on June 16, 1990 to inquire whether the Operations Division was currently in a position to supply a response. At that time, Mr. R. Shaw indicated that Central Region would not be providing a response and that the information package had been forwarded to MDE's York-Durham and Peterborough Districts with direction to respond only if significant concerns emerged from a review of the material.

Since the Project Team has not received a response from the MOE District Offices involved, we are now proceeding with finalizing and analyzing the route alternatives on the understanding that no significant concerns have arisen and that there is general agreement from MOE technical review staff with the material in question. Further, it is our understanding that staff have not identified any outstanding data requirements or additional factors, outside the information gaps cited by our own team, which should be incorporated during the analysis and evaluation of route alternatives.

Mr. Guscott
July 10, 1990
Page 2

If this interpretation differs from that of you or your staff at the District Offices, please advise us as soon as possible so that any concerns you may have can be addressed.

Yours very truly
FENCO ENGINEERS INC.



Ian K. Upjohn, M.C.I.P.
Principal Planner
Environmental Services
Transportation

IKU/gsw

53425

cc: D. Beach	MOE York-Durham District
J. Borque	MOE Peterborough District
P. Reynolds	MTO
K. Harding	MTO
R. Smith	Parker Consultants
P. Prier	ESP



Ministry
of the
Environment

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l'Environnement

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AUG 01 1990

AUG 01 1990

CENTRAL REGION
PLANNING & DESIGN

250 Davisville Avenue
Toronto, Ontario
M4S 1H2

250, avenue Davisville
Toronto (Ontario)
M4S 1H2

APPROVALS BRANCH

440-3591

3rd Floor

July 27, 1990

Ms. K. Harding
Environmental Planner
Environmental Unit
Ministry of Transportation
Atrium Tower, 5th Floor
1201 Wilson Avenue
Downsview, Ontario
M3M 1J8

Dear Ms. Harding:

RE: HIGHWAY 407, PRE-SUBMISSION CONSULTATION
ROUTE PLANNING AND PRELIMINARY DESIGN STUDY
HIGHWAY 48 TO OSHAWA/WHITBY BOUNDARY
OSHAWA/WHITBY BOUNDARY TO HIGHWAY 35/115
OUR FILE: 11-04-08

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HAMILTON ENGINEERS
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<i>[Signature]</i>
File

This office has completed its review of your response of July 10, 1990 to our comments on (i) Transit assumptions for noise analysis purposes and (ii) Evaluation criteria for route planning.

With regard to your response, we wish to indicate the following:

TRANSIT ASSUMPTIONS FOR NOISE ANALYSIS PURPOSES

1. We concur with the statement that the sound generated by horns could be replaced by whistle noise for purposes of assessing the noise impacts generated by rail traffic.
2. We maintain that rail and air traffic noise should be excluded from the background sound levels used in the assessment of highway traffic noise impacts. This issue has been the subject of many discussions between our Ministries on several EA's. For example, we refer you to the numerous discussions which took place on the Highway 6 (Hamilton to Caledonia) EA and the position adopted by your Ministry on that project.
- 3/4. We have no concerns with regard to the response contained in Points 3 and 4.

EVALUATION CRITERIA FOR ROUTE PLANNING

1. The first indicator referred to in Paragraph 1 should include all noise sensitive receivers which will experience resultant future sound levels greater than the pre-existing background sound level and not only those greater than 55 dBA (refer to our letter of March 20, 1990). The above statement should serve as the basis of the definition for this indicator which is contained in the Document "Evaluation Criteria" (Page 4). This statement should also be reflected in the Noise Impact Tables for Alternative Routes.
2. With regard to Paragraph 2, in order to avoid a possible misinterpretation; the Noise Impact Table for each Route Alternative should indicate the resultant future sound levels (levels greater than the pre-existing background sound level) in ranges of 5 dB. Within each sound level range, the Table should also indicate the number of noise sensitive receivers which will experience changes (+/-) in sound levels in ranges of 5 dB over the pre-existing condition.

We trust that the above will be of assistance in completing your noise study for the Highway 407 EA.

Yours very truly,

R. Krawczyński

R. Krawczyński
Project Analyst, Acoustics
Noise Assessment & Systems
Support Unit

RK/mss

cc: L.G. Kende
M. Sheppard



Ministry
of the
Environment

Ministère
de
l'Environnement

250 Davisville Avenue
Toronto, Ontario
M4S 1H2

250, avenue Davisville
Toronto (Ontario)
M4S 1H2

November 16, 1990

440-6987

Mr. H.A. McNeely
Supervisor, Environmental Unit
Ministry of Transportation
Atrium Tower
1201 Wilson Avenue
Downsview, Ontario
M3M 1J8



Dear Mr. McNeely:

Re: The Ministry of Transportation's Highway 407 Overview Study
(Highway 48 to 35/115), September 20, 1989
EA File No: TC-CE-02

Attached are my comments on the above report as requested. I have reviewed the report according to the requirements of the Environmental Assessment Act along with its associated policies and guidelines. The "Interim Guidelines on Environmental Assessment Planning and Approvals", July 1989, is enclosed for your information.

I understand that this overview study was undertaken to determine only the rationale and need for Highway 407, however, I have taken this opportunity to explain what will be required of the final Environmental Assessment. Comments specific to the overview study are made in Part 1(a), (d) and Part 2 (2).

I will be pleased to meet with you on November 23, 1990, as arranged, to discuss these comments in further detail.

Sincerely,

Joan Lockhart-Grace
Senior Environmental Planner
Environmental Assessment Branch

enclosure

cc: P. Reynolds, MTO
B. Hodgins, MTO
M. Sheppard, MOE
N. Wood, MOE
R. Hodge, MOE



Ontario

Ministry of Transportation
Ministère des Transports



Planning and Design
Environmental Unit
Central Region
1201 Wilson Avenue
Atrium Tower, 5th Floor
Downsview, Ontario
M3M 1J8

Tel. # (416) 235-5547

December 5, 1990

Mr. D. Beach
District Officer
York-Durham District
Ministry of the Environment
4th Floor, 7 Overlea Boulevard
Toronto, Ontario
M4H 1A8

Dear Mr. Beach:

Re: Highway 407 Route Planning and
Environmental Assessment Study
Highway 48 - Highway 35/115
W.P.'s #282-86-01 and 326-88-01

RECEIVED
LAVALIN ENGINEERS

DEC 14 1990

Route To: Init.

DEC 14 1990

This is to confirm our telephone conversation of November 7, 1990, regarding any concerns or comments from your District on the above-noted study prior to our Route Evaluation phase. From our conversation it was determined that your District has no outstanding concerns at this time, and would prefer to meet with the Study Team and make any comments after the evaluation process, with this additional information available.

The External Team will be contacted shortly after the technically preferred route has been selected to discuss the evaluation process and the outcome. It is anticipated

.../2

that arrangements for that meeting will be made in Spring of 1991.

Yours truly,

Kathleen Harding

Kathleen Harding
Environmental Planner

KH/ac

c.c. B. Shaw, MOE, Central Region, Technical Support Section
G. Casonato, MOE, Central Region, Approvals and
Planning Unit
M. Sheppard, MOE, Municipal Approvals Section, Land Use
Planning
J. Lockhart-Grace, MOE, Environmental Assessment Branch
P. Reynolds, MTO
C. Lumley, MTO
~~J. Upjohn, EFENCO~~
D. Coutts, C.C. PARKER
P. Prier, E.S.P.

407MOEDB.KHL



Planning and Design
Environmental Unit
Central Region
1201 Wilson Avenue
Atrium Tower, 5th Floor
Downsview, Ontario
M3M 1J8

Tel. # (416) 235-5547

December 5, 1990

Ms. G. Casonato
Environmental Assessment
Coordinator
Approvals and Planning Unit
Ministry of the Environment
Central Region
4th Floor, 7 Overlea Boulevard
Toronto, Ontario
M4H 1A8

Dear Ms. Casonato:

Re: Highway 407 Route Planning and
Environmental Assessment Study
Highway 48 - Highway 35/115
W.P.'s #282-86-01 and 326-88-01

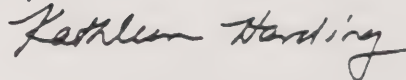
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LAVALIN ENGINEERS	
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KW	
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This is to confirm our telephone conversation of November 21, 1990, regarding any concerns or comments from your office on the above-noted study prior to our Route Evaluation phase. From our conversation it was determined that you had no outstanding concerns at this time, and would prefer to meet with the Study Team and make any comments after the evaluation process, with this additional information available.

The External Team will be contacted shortly after the technically preferred route has been selected to discuss the evaluation process and the outcome. It is anticipated

that arrangements for that meeting will be made in Spring of 1990.

Yours truly,



Kathleen Harding
Environmental Planner

KH/ac

- c.c. B. Shaw, MOE, Central Region, Technical Support Section
- G. Casonato, MOE, Central Region, Approvals and Planning Unit
- M. Sheppard, MOE, Municipal Approvals Section, Land Use Planning
- J. Lockhart-Grace, MOE, Environmental Assessment Branch
- P. Reynolds, MTO
- C. Lumley, MTO
- ~~S. Upjohn, FENCO~~
- D. Coutts, C.C. PARKER
- P. Prier, E.S.P.

HWY407B.KHL



Ministry
of the
Environment

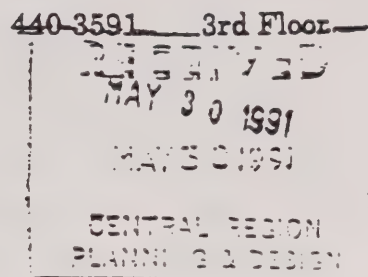
Ministère
de
l'Environnement

APPROVALS BRANCH

250 Danville Avenue
Toronto, Ontario
M4S 1H2

250, avenue Danville
Toronto (Ontario)
M4S 1H2

May 23, 1991



Ms. K.A. Harding
Environmental Planner
Ministry of Transportation
Atrium Tower
1201 Wilson Avenue
Downsview, Ontario
M3M 1J8

Dear Ms. Harding:

RE: HIGHWAY 407 EA
RECOMMENDED ROUTE FOR HIGHWAY 407
FROM HIGHWAY 48 TO HIGHWAY 35/115
PRESUBMISSION CONSULTATION
OUR FILE: 11-04-08

Further to our conversation of May 13, 1991, we wish to inform you that due to workload, staff of the Noise Assessment and Systems Support Unit of the Ministry of the Environment may find it difficult to review the technical papers on the recommended route which will be submitted by your Ministry.

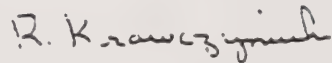
In order to identify major problems early in the development of the Draft EA without our having to conduct a review of these technical papers, we recommend that your Ministry also submit a brief but comprehensive outline of the analysis of the noise impacts along the recommended route. We refer specifically to a statement of: the criteria, the methodology and procedures used in the analysis and the plan of action with regard to mitigation measures. This plan of action should include a brief description of the future work which will be undertaken by your Ministry to ensure that excessive noise levels generated by the construction and operation of the facility will be reduced as much as technically, economically and administratively possible.

In addition to the above, the outline should also address our uncertainty regarding the studies which will be conducted to determine the preferred public transit facility

and its impacts on this site as well as the relationship of these studies to the Highway 407 EA and the mitigation measures contained therein. With regard to the rail transit facility assumed in the EA for purposes of assessment of the worst case noise impacts, the outline should address; (a) the impacts which will be investigated; noise (i.e., types) or noise and vibration and (b) details regarding the methodology used in the analysis of these impacts.

We trust that the above will be of assistance in formulating a brief but comprehensive outline of the analysis of the noise impacts along the recommended route. Should you have any questions on the information required by our Ministry, please contact the undersigned.

Yours truly,



R. Krawczyniuk
Project Analyst, Acoustics
Noise Assessment and Systems Support Unit

RK/jet

cc: L.G. Kende
I. Isman



Ministry
of
Transportation

Ministère
des
Transports

RECEIVED

11/30/92

[Handwritten signature]

Planning and Design
Environmental Unit
Central Region
Atrium Tower, 5th Floor
1201 Wilson Avenue
Downsview, Ontario
M3M 1J8

Telephone (416) 235-5546

November, 30, 1992

Mrs. Ina Isman
Senior Planner
Land Use Planning Unit
Approval Branch
Ministry of the Environment
3rd. Floor, 250 Davisville Avenue
Toronto Ontario
M4S 1H2

Dear Mrs Isman

Re: Highway 407/Transit Transportation Corridor
Route Planning/Environmental Assessment Study
From Highway 48 in Markham to Highway 35/115
in Newcastle (61 km)

This letter will serve to confirm our telephone discussion, of this date, regarding your letter of September 13, 1991, in which you outlined the process which the Ministry of the Environment (MOE) will be following in reviewing the Highway 407 Project.

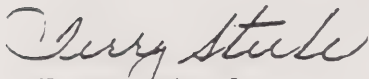
In general terms:

- a) MOE, Environment Approval Branch will be co-ordinating the comments of appropriate MOE Head Office and Regional/District offices only following submission of full draft E.A.;
- b) MOE, Environmental Assessment Branch will provide comments regarding the administration (requirements and procedural matters) of the Environmental Assessment Act;
- c) As outlined in your letter, MOE Approval Branch will not be providing comments on the Technical Working Papers or the Technical Preferred Route until such time as MTO submits the Highway 407 Environmental Assessment Report;

- d) MTO may continue to request comments regarding specific environmental technical factors, ie. noise, stormwater etc., directly from the appropriate MOE Office, with copies of the request being provided to the MOE Approval Branch and Environmental Assessment Branch Co-ordinators for their information.

Should you require additional information at any time, please do not hesitate to contact the under signed.

Yours truly,



Terry Steele
Environmental Planner

TAS/tas

c.c. G. Casonato	- Ministry of the Environment
G. Higgins	- Ministry of the Environment
C. Lumley	
P. Reynolds	
D. Ivanauskas	
I. Upjohn / A. Minchev	- Fenco Engineers Inc.
D. Coutts / R. Smith	- C. C. Parker Consultants

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Ministry of Transportation
Ministère des Transports

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Atrium Tower, 5th Floor
1201 Wilson Avenue
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M3M 1J8

Telephone (416) 235-5546

March 4, 1993

Mr. Jim Merritt
Director
Central Region
Ministry of the Environment
4th Floor, 7 Overlea Boulevard
Toronto, Ontario
M4H 1A8

Attention: Ms G. Casonato
Environmental Assessment Coord.

Dear Sir:

RE: Highway 407/Transit Transportation Corridor
Route Planning/Environmental Assessment Study
From Hwy 48 in Markham to Hwy 35/115 in Newcastle

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In May 1991, the Ministry of Transportation held a meeting with external agencies to present the technically preferred route for the proposed Highway 407.

In August 1991, a full information package on the proposed route was forwarded to Central Region, Ministry of the Environment and other external contacts for their review and comment. This included: mapping of the alternative routes considered; maps of the proposed route (i.e. the "technically preferred route"); the staged evaluation summary as text and tables; a listing of factors and indicators used in the analysis and evaluation; and information specific to previous input received from each contact.

Over the last 18 months Ministry of Transportation staff and consultants have continued to contact by phone and by mail Central Region, Ministry of the Environment requesting comments on the route recommendation for Highway 407.

To date the Ministry of Transportation has not received a response from Central Region, Ministry of the Environment.

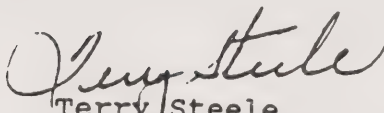
This study is being conducted under the full requirements of the Environmental Assessment Act. It is important that work being carried out and preliminary recommendations at each stage be discussed with other agencies, municipalities and the public as they occur and before any final decisions to proceed.

However, in fairness to other parties that have expressed an interest in the progress of the Highway 407 study, particularly those potentially affected by its progress and findings such as other agencies, municipalities and property owners, it is felt that the Highway 407 study should not be delayed for comments any longer than the year that has passed since the request was sent to your Region of the Ministry of the Environment in August, 1991.

Unless a response is received by March 31, 1993, the Ministry of Transportation will reluctantly proceed on the understanding that your Region of the Ministry of the Environment has no concerns with the work carried out to date or with the route location as proposed at the present level of planning. We would welcome any comments from Central Region Ministry of the Environment whether complete or preliminary. However, we must proceed with the planning of this extremely high priority, provincial initiative.

Should you have any comments please forward them to Mr. P. Reynolds, Project Manager for these studies, Transportation Planning Section, 3rd. Floor Atrium Tower, 1201 Wilson Avenue, Downsview, Ontario, M3M 1J8.

Yours truly,


Terry Steele
Environmental Planner

PR/TAS/tas

cc: G. Casonato - Ministry of the Environment
G. Higgins - Ministry of the Environment
P. Reynolds
D. Ivanauskas
T. Steele
I. Upjhon / A. Minchev - Fenco Engineering Inc. ✓
D. Coutts / R. Smith - C.C. Parker Consultants

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Planning & Design Section
Environmental Unit
Central Region
Atrium Tower, 5th Floor
1201 Wilson Avenue
Downsview, Ontario
M3M 1J8

Telephone (416) 235-5546

December 20, 1993

R Krawczyński
Project Analyst, Acoustics
Noise Assessment and Systems Support Unit
Approval Branch
Ministry of Environment and Energy
3rd Floor, 250 Davisville Avenue
Toronto, Ontario
M4S 1H2

Dear Sir:

Re: Highway 407/Transit Transportation Corridor
Route Planning and Environmental Assessment Study
Highway 48 to Highway 35/115
Noise Technical Methodology Route Selection Phase

In response to your letter of May 23, 1991 (copy attached), our consultant has provided the following information.

Methodology:

In general, the noise assessment methodology applied to the Highway 407/Transit Transportation Corridor project complies with MTO/MOEE standards, as outlined in the MTO Noise Manual, with the exception of two minor deviations outlined below.

As noted previously, sound level calculations are being carried out to 50 dBA (24 hour Leq) possibly beyond the usual 600m limit used to evaluate noise impacts. Special methods of calculating the sound levels at these distances have been previously documented.

No attempt has been made to catalogue the number of houses impacted between 0 and 5 dBA, due to the enormous impact footprint this would entail and the standard margin of error for environmental assessments. For example, a 1 dBA impact may occur as far away as 3.2 kms. Hence, we are using a

...2/

minimum of 5 dBA impact to indicate significant noise effects, and carrying the analysis out to 50 dBA Leq (actually, approximately 48.5 dBA).

Reviews:

To date a number reviews have been completed through the Ministry's noise assessment process. These reviews are as follows:

1. Screening the study area for possible routes;
2. Developing alternatives on base mapping to permit screening;
3. Assessing the most likely alternatives on the basis of a noise model that assumes flat unshielded terrain using traffic projections provided for the mature operating condition with and without the project;
4. Modifying the noise contours in those areas where the flat earth model level of accuracy might lead to erroneous results (for example: in built up areas or near valleys);
5. Identifying the number of housing units in the various 5 dBA wide categories for both the increment in level and absolute sound levels;
6. Commenting upon the potential for mitigation of identified impact along the various routes.

The above has been prepared in tabular form for inclusion into the overall selection of a technically preferred route comparative evaluation process.

Rail Transit:

With regard to the possibility of rail transportation in conjunction with the highway facility, an analysis was carried out with the assumption that the rail transit facility would be located on the south side of each alternative. As there are no projected transit volumes for this corridor, a projection was made on the basis that the transit service would use heavy rail equipment similar to the existing GO rail corridors with a volume of approximately 44 trains per day (full service assuming that the trains were not outposted at the east end of the facility).

The results of the analysis indicates, that the effect of the rail component, would offset the noise contours near the highway, but leave the distant sound levels virtually unaffected. Over most of the affected stretch of highway, the increment in the sound levels at 500m is only 1 dBA, (when the rail traffic 18 hour Leq is added to the roadway traffic 24 hour Leq).

Based on these assumptions the inclusion of the rail component, has virtually no impact on the route selection process.

At this time there is no anticipation of attempting any evaluation of rail vibration at this level of detail. The possibility of a vibration problem could imply, due to short setbacks, a very large noise problem. Thus, the screening steps for noise impact will capture, as highly impacted, any location likely to have a vibration impact.

Construction Noise:

As far as construction noise is concerned, standard limitations in place at the time will apply.

Mitigation Measures:

During preliminary design a STAMINA 2.0 noise model analysis will be carried out to identify specific noise mitigation requirements along the technically preferred route. Identified opportunities for mitigation measures will be assessed based on current MTO/MOEE policies.

We trust the above will assist in your monitoring of this project. Please do not hesitate to contact the undersigned should there be any questions.

Yours truly,



Terry Steele
Environmental Planner

att.

cc P. Reynolds
J. Coulter
D. Coutts
R. Smith
A. Minchev
I. Upjohn
D. Ivanauskas
B. Stephenson

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JUL 15 1996

ENVIRONMENTAL PLANNING AND ANALYSIS BRANCH

Telephone: (416) 440-3739
Facsimile: (416) 440-7039

July 5, 1996

Bob Hodgins, Manager
Ecoplans Limited
2655 North Sheridan Way
Mississauga, Ontario
L5K 2P8

Dear Mr. Hodgins:

RE: HIGHWAY 407/MARKHAM ROAD AREA FEASIBILITY STUDY

In response to your letter dated June 18, 1996, the following comments are provided.

Our technical review is based on the requirements of the Environmental Protection Act, the Ontario Water Resources Act, the Pesticides Act and the Ministry of Energy Act, and accompanying policies, guidelines and programs areas. Our mandated areas of concerns include air quality, surface and ground water, soil/sediment, pesticides, land use compatibility, noise and vibration, energy and waste management.

In EA submissions, whether individual EAs or exemptions, proponents are expected to acknowledge the range and types of environmental impacts anticipated as a result of the undertaking, how these impacts may reasonably be evaluated and how they will be managed as part of the undertaking. The level of detail of information required will vary with the nature of the undertaking and the potential effect on an MOEE area of interest. In some situations, proponents have concluded in their submission that it is not feasible to assess certain impacts in a detailed manner. Under the current review process, the proponent's position will be reviewed by both our Ministry staff as well as by the public at the time of the submission of the document.

With respect to air, we anticipate that MTO's submission will include a discussion of air quality such that the position of the proponent with respect to both site specific air quality issues and global air quality issues is clarified. The lack of a policy has not prevented proponents from including a discussion on air quality impacts in past EA submissions.



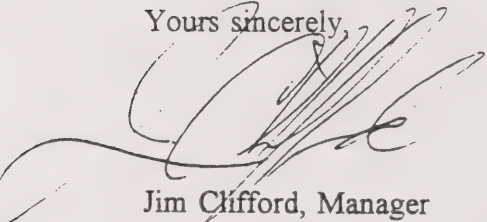
With respect to groundwater, valley crossings, and monitoring, the proponent has indicated that there will be ongoing discussions with affected stakeholders to ensure proper protection measures are developed and implemented. Given the proponent's tight timelines, this approach is adequate to ensure that the proposed undertaking proceeds in an acceptable manner. It is our expectation that during the design and construction phases, consideration will be given to the integration/linkages between the study elements, and the structural and functional relationships among air, land and water.

Further to your comments on monitoring, this Ministry does not generally request proponents to undertake monitoring for research purposes as part of an EA undertaking; however, we do recommend that monitoring be undertaken to ensure the following: that the undertaking does not adversely affect the environment where possible; if mitigation is required, the mitigation achieves what it is intended to achieve; and, where the mitigation is not effective, other forms of mitigation will be considered.

I have no other comments to offer at this time. However, while every effort is being made by our staff to provide sufficient direction prior formal submission an exemption request, due to the lack of detail available at this time, issues may be raised subsequently to ensure that our mandated areas of concern are adequately addressed.

If you have any questions, please contact Elizabeth Janz at the (416) 440-6986.

Yours sincerely,



Jim Clifford, Manager
Environmental Planning Section

cc. D. Morneau, Ministry of Transportation
R. Ryan, Central Region Office



2655 North Sheridan Way
Mississauga, Ontario
L5K 2P8
Phone: (905) 823-4988
Fax: (905) 823-8503

Ministry of Environment and Energy
Environmental Planning and Analysis Branch
250 Davisville Ave., 3rd Floor
Toronto, Ontario
M4S 1H2

June 18, 1996

Attention: Ms. Elizabeth Janz

Dear Elizabeth:

RE: HIGHWAY 407/MARKHAM ROAD AREA FEASIBILITY STUDY

This letter is to update you on the status of the Highway 407/Markham Road Feasibility Study, to advise you on how MTO proposes to respond to the comments in your February 23, 1996 letter, and obtain MOEE's agreement to proceed with E.A. Act approval.

Over the past several months the Ministry has been analyzing the options for addressing the traffic problems at Markham Road, and holding discussions with its municipal partners, external agencies and the public.

The Ministry is preparing for the design and construction phases of Highway 407 east of Markham Road, which will include the identification and development of environmental mitigation and enhancement measures. This will be done in consultation with affected stakeholders as outlined in the attached Stakeholder Consultation Process. It is through this process that your site-specific concerns can be addressed.

The following responds to the points raised in your February 23rd, 1996 letter:

- **Air Quality** - The MTO has not yet completed documentation of the Highway 404 air quality study or developed general conclusions that can be applied to the Highway 407 project. Until this work has been completed and until MTO has reached a policy agreement with MOEE on how the study results should be applied to other projects, the Ministry cannot commit to project specific air quality studies for the Highway 407 project. If a policy agreement is reached by the time the design phase is initiated, and it is practical to do so, efforts will be made to accommodate MTO/MOEE policy at that time.

- **Traffic Concerns** - The purpose of the study is to address the traffic-related concerns in the vicinity of the Town of Markham without causing unacceptable impacts elsewhere in the transportation system. As such, the alternatives under consideration are being evaluated on, among other things, the potential traffic implications for the existing network and local communities.
- **Groundwater** - The environmental report currently being prepared will discuss the hydrogeological conditions of the study area. Most of the study area is overlain by low permeable soils. The exception is in the area east of North Road in Pickering where the overburden is of higher permeability. There are also known discharge areas in the West Duffins Creek and Urfé Creek valleys.

The potential impacts of concern associated with any highway are the loss of recharge area due to the construction of the facility; the potential impacts of infiltration of highway runoff containing hydrocarbons, heavy metals and salt, on groundwater; and potential impacts on wells from both the construction and operation of the highway.

The technically preferred route proposed for Highway 407 is predominantly in an area of low recharge potential. During the Route Planning Phase information on study area groundwater conditions was obtained from all available sources. Avoidance of the higher potential recharge areas was a factor in developing alternative routes and selection of the preferred alternative. During the design phase, a Stormwater Management Plan will be developed in consultation with affected stakeholders, to address how highway drainage will be managed. In the development of this plan, consideration will be given to the implications of infiltration on groundwater quality. In addition, well quality or quantity problems resulting from the undertaking will be addressed as needed during the design and construction phases.

- **Noise** - A noise study was carried out in accordance with MTO/MOEE protocol, as part of the Route Planning Study. The potential for noise impacts was a factor considered in the assessment of route alternatives. This noise report was provided to your Ministry during the Route Planning Study. The results of the report will be summarized in the environmental report being prepared for the current study. During the design phase a more detailed noise analysis will be carried out and specific mitigating measures will be developed in accordance with the MTO/MOEE Noise Protocol.

The major developers in the study area and the local municipalities have been involved throughout the Highway 407 study and have been developing their plans with the Highway 407 in mind. Therefore the noise implications of Highway 407 will be addressed through a combination of noise mitigation measures developed during the Highway 407 design phase, and municipal land use controls place on developments proposed adjacent to the Highway.

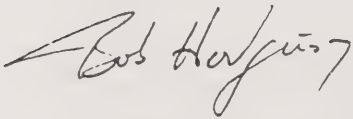
- **Use of Up-to-date Policies** - The Highway 407 study has been carried out over many years, and both MTO and MOEE policies have undergone varying degrees of change in that period. Through the designated external contacts and representatives of other MTO offices on the project team, the applicability of new or revised procedures are identified and applied where practical.
- **Valley Crossings** - The study team has recognized that the most significant environmental constraints for this undertaking are the river crossings. Bridges are proposed for the major rivers to minimize the impacts on the watercourses and the valleys. Ongoing consultation will be carried out with affected stakeholders during the design and construction phases to ensure that proper protection measures are developed and implemented.
- **Permits and Approvals** - All necessary permits and approvals required for the undertaking will be obtained during the design and construction phases. Compliance with all legal requirements is expected and is generally not detailed in an EA document. However, to ensure that your point is not missed, it has been included in the objectives listed in the attached Stakeholder Consultation Process, which will be included in the environmental document.
- **Monitoring** - Although MTO regularly carries out compliance monitoring of its projects, the Ministry has not reached any policy agreement with MOEE on determining the need for scientific monitoring for research purposes on individual projects and therefore is not prepared to commit to scientific monitoring at this time. It is normal practice for the constructor to implement an audit program during construction to ensure that environmental protection measures have been implemented and are being properly maintained. During the design phase the need for post-construction monitoring (i.e. stormwater, fisheries), will be determined in consultation with stakeholders.

Ministry of Environment and Energy
Ms. Elizabeth Janz
June 18, 1996
Page 4

We trust that the foregoing addresses the requirements of your agency. The Ministry of Transportation's Project Team will now be preparing draft documentation of the proposal for submission to MOEE under the requirements of the EA Act. Your written confirmation that the measures being proposed are satisfactory for this undertaking is requested by July 3rd, 1996.

Yours truly;

Ecoplans Limited



Bob Hodgins, B.Sc (Ag), MBA
Manager, Mississauga Office

Encl.

c.c. F. Leech
P. Jankowski
D. Morneau
P. Reynolds
J. Dougall
I. Burkhardt
G. Higgins

Ministry of
Environment
and Energy

Ministère de
l'Environnement
et de l'Énergie

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Toronto ON M4S 1H2

ENVIRONMENTAL PLANNING AND ANALYSIS BRANCH

Telephone: (416) 440-3739
Facsimile: (416) 440-7039

November 8, 1996

Bob Hodgins, Manager
Ecoplans Limited
2655 North Sheridan Way
Mississauga, Ontario
L5K 2P8

NOV 19 1996

Dear Mr. Hodgins:

**RE: HIGHWAY 407/MARKHAM ROAD AREA ENVIRONMENTAL
ASSESSMENT STUDY**

Further to your letter dated October 2, 1996, please be advised that two weeks for review of an EA document is not a sufficient amount of time. In general, technical staff of the Ministry require a 90 day review period for both draft and formal EA submission. However, staff of this Branch will make every effort to accommodate your request in as timely manner as possible.

In our efforts to assist in meeting your time schedule, staff of this Branch have met with you and the proponent to discuss the proponent's approach for addressing concerns raised in our letter date July 5, 1996. As per the discussion, staff have followed up on the air quality and noise concerns with appropriate technical staff within the Ministry and provide the following comments.

The proponent's approach outlined in the draft of Section 6 of the EA is acceptable.

With respect to noise, please revise the discussion of noise in Section 6.4.2 of the draft as follows:

1) Add the following two objectives:

- "• *Establish operational noise impacts*
- *Prior to start-up of construction, the sections of the Design and Construction*

Report(s) dealing with noise and vibration will be submitted to the Director of the Approvals Branch of MOEE for review and comment."

- 2) Change the wording in the existing 2nd objective to read: *"If sound levels exceed the applicable limits, development and implement...."*
- 3) Expand the wording of the 4th objective to read: *"Minimize construction noise by ensuring that construction equipment used in the project meets the noise emission limits contained in the MOE Model Noise Control By-Law and that noise control devices...."*
- 4) Delete the 5th objective from the list. Criteria for assessing feasibility of noise mitigation are set out in the MTO/MOEE Noise Protocol for MTO highway projects.

I understand that a number of other areas including ecosystem planning, surface and ground water, soil/sediment, pesticides, land use compatibility, energy, waste management, mitigation and monitoring were discussed and that MTO will be addressing these concerns in the EA submission.

If you have any questions, please contact Elizabeth Janz at the (416) 440-6986.

Yours sincerely,



Jim Clifford, Manager
Environmental Planning Section

- cc. P. Reynolds, Ministry of Transportation
D. Morneau, Ministry of Transportation
R. Ryan, Central Region Office
C. Krajewski, Noise Unit
R. Bell, Science & Technology Branch
B. Nixon, Environmental Planning & Analysis Branch

Health



Ministry Ministère
of de
Health la Santé

Ontario

5th Floor
15 Overlea Boulevard
Toronto, Ontario
M4H 1A9

5^e étage
15, boulevard Overlea
Toronto (Ontario)
M4H 1A9

Public Health Branch
Direction de la santé publique

(416) 327-7392

Fax
(416) 965-7323

October 17, 1991

I.K. Upjohn, M.C.I.
Principal Planner
Environmental Services, Transportation
Fenco Engineers Inc.
Atria North - Phase II
2235 Sheppard Avenue East
Willowdale, Ontario
M2J 5A6

Dear Mr. Upjohn:

RE: Highway 407/Transit Transportation Corridor
Highway 48 - Whitby/Oshawa Boundry
Route Planning and Environmental Assessment Study

RECEIVED	
OCT 25 1991	
Route To:	
<i>IK</i>	<i>MS</i>
File:	

Thank you for your correspondence regarding the above study.
Dr. Richard Schabas has asked me to respond to you directly.

Although the Public Health Branch is interested in the public health aspects of this study, we recommend that you request input from the local medical officer of health for the health unit in which the study is located. His name and address is:

Dr. R. Kyle
Medical Officer of Health
Durham Regional Health Unit
Community Health Services Centre
301 Golf Street
Oshawa, Ontario
L1G 4B2
(416) 723-8521

We appreciate your taking the time to bring this study to our attention and have no further comment at this time.

Sincerely,

Lesbia F. Smith, MD
Senior Medical Consultant
Environmental Health and Toxicology Unit
Disease Control Service

cc: Dr. R. Kyle

Municipal Affairs & Housing



Ministry Ministère
of du
Housing Logement

Land Development Group
12th Floor, 777 Bay Street
Toronto, Ontario M5G 2E5
Telephone: (416) 585-6214
Facsimile: (416) 585-7455

September 18, 1992

MEMORANDUM TO:

Patrick Reynolds
Project Manager
Transportation Planning Section
Central Region
Ministry of Transportation

SUBJECT:

PROPOSED MINOR ALIGNMENT SHIFT
HIGHWAY 407/TRANSIT CORRIDOR
HIGHWAY 48 TO HIGHWAY 35/115
TOWN OF MARKHAM

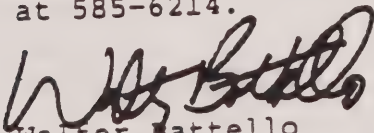
In response to the letter of September 8, 1992 by Fenco Engineers Inc., on behalf of the Ministry of Transportation, we would like to inform you that the Ministry of Housing is in agreement with the new alignment shift segment recommended by MTO, referred to as "S3S".

As outlined in the comparative analysis and evaluation which you have provided, the S3S alignment is superior based on environmental, economic, and transportation planning criteria.

From the Ministry of Housing's point of view the S3S alignment is especially beneficial for the Province's major affordable housing initiative, the 9th Line Study Area, which comprises mainly government owned lands north of the proposed Highway 407 between 9th Line and the Markham Bypass.

The S3S alignment will allow the 9th Line Study Area to be expanded by 15 to 25 hectares (37 to 62 acres) as S3S is between 100m and 300m south of alignment S3 between 9th Line and the Markham Bypass. The S3S segment also allows for more flexibility in locating a north-south arterial road between the Markham Bypass and the Little Rouge Creek, as proposed by the 9th Line Study Area consultant, Andres Duany.

Thank you for the opportunity to comment on this matter. Should you need additional information, please contact me at 585-6214.


Walter Battello
Community Planner
Land Development Group

cc: Dino Chiesa





CORNELL DEVELOPMENT GROUP

Station Plaza, 227 Main Street North
Markham, Ontario L3P 1Y6
Tel: (905) 472-4523, Fax: (905) 472-2062



September 23, 1996

John Sutherns
McCormick Rankin
2655 North Sheridan Way
Mississauga Ontario
L5K 2P8

SEP 26 1996

Dear Mr. Sutherns:

Re: Environmental Assessment - 407 East of Highway 48
Your Project Number 3199

This letter is to confirm that the planning of Cornell (formally East Markham) has taken place on the assumption of the 407 being build within the Technically Preferred Right of Way as previously identified by the Ministry of Transportation. The approved Secondary Plan for Cornell reflects this assumption.

Copies of the Secondary Plan have been provided to the potential purchasers of the Cornell lands. As well the 407 right of way was identified on all sale documents.

While the deal with the new owner for all the development land within Cornell should be formally concluded before the end of the year, the actual transfer of land will take place in stages. The first transfer will be the land area covered by the draft plan of subdivision (north of the hospital, adjacent to the 9th Line) that has recently been approved by the Town of Markham. Land south of highway 7 to the 407 ROW will continue to be owned by the Government until it is required for the ongoing development of the Cornell community.

Yours truly,

Evan Wood-Brunet
Manager of Planning
Cornell Development Group

January 31, 1996

MEMORANDUM TO: Denise Morneau
Project Engineer
Planning Office, Central Region
Ministry of Transportation

RE: Highway 407 Partial Extension

Thank you for inviting me to the meeting of provincial agency representatives last week to hear the presentation on the assessment of options for an interim extension of Highway 407. I appreciate the urgency of the issues and the need for an early construction start if solutions are to be effective. The Seaton Planning Team supports the study as outlined by your consultants, provided, of course, that potential environmental effects of the options are identified, analyzed and taken into account at an acceptable level of analysis.

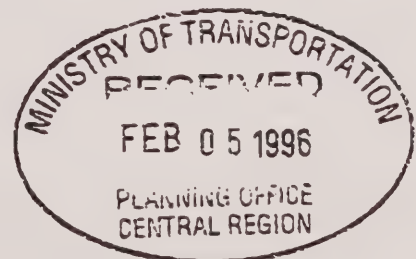
Since the government has decided to proceed with development of the Seaton lands, it is likely that the results of your study will affect our project. Our objectives are to obtain approval of a secondary plan for Seaton as a prelude to marketing the lands and to manage the lands strategically so as to maximize the return to the Province from the asset.

It will be important to us to be informed about the results of your study as early as possible. I would like to suggest a meeting to discuss the findings prior to the finalization of your recommendations, if possible. Both of our projects will benefit from a coordinated approach.

Annette Payne

Annette Payne
Manager,
Seaton Planning Team

c.c. Robb Minnes



Native Affairs



Ontario
Native Affairs
Directorate

Direction générale des
affaires autochtones
de l'Ontario

720 Bay Street
4th Floor
Toronto, Ontario
M5G 2K1

720, rue Bay
4^e étage
Toronto (Ontario)
M5G 2K1

Tel. (416) 326-4740
Fax (416) 326-4017

July 13, 1989

Patrick J. Reynolds
Senior Transportation Planner
Transportation Planning Section
M.T.O. Central Region
5000 Yonge Street
Willowdale, Ontario
M2N 6E9



Dear Mr. Reynolds:

I received your letter dated June 6, 1989, regarding the Route Planning/Environmental Assessment Study for the proposed Highway 407 route.

The proposed study area identified in the Key Plan does not include Indian Reserves or Native communities, and it does not appear that the proposed highway will have any direct impact on Native people. However, the Native Affairs Directorate is interested in continuing to review this proposal through the pre-submission consultation process.

The contact person within the Directorate is:

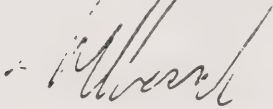
Dr. David T. McNab
Manager
Lands and Natural Resources
326-4764

...2/

Additional material relating to this proposal should be sent directly to Dr. McNab.

Thank you for consulting with the Native Affairs Directorate on this matter.

Yours truly,

A handwritten signature in dark ink, appearing to read 'Mark Krasnick', written over the typed name.

Mark Krasnick
Executive Director

Tune 1 -

**Ontario Native Affairs
Secretariat**

10th Floor, Suite 1009
595 Bay Street
Toronto ON M5G 2C2

Tel.: (416) 326-4740
Fax: (416) 326-4017

**Secrétariat des affaires
autochtones de l'Ontario**

10^e étage, bureau 1009
595 rue Bay
Toronto ON M5G 2C2

Tél.: (416) 326-4740
Télééc.: (416) 326-4017

**Ontario****JAN 24 1996**

Mr. John Sutherns
McCormick Rankin
Consulting Engineer
2655 North Sheridan Way
Mississauga, On L5K 2P8

Dear Mr. Sutherns:

RE: Highway 407 and Highway 48 Study

Thank you for your correspondence, dated January 17, 1996, requesting Ontario Native Affairs Secretariat's (ONAS) comments on the above-noted subject.

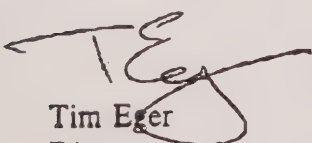
As one of the Ontario Ministries involved in the government review of environmental assessments, the Secretariat plays two roles: encouraging early consultation by the proponent with Aboriginal communities which may be affected, and advising proponents of the existence of Aboriginal land claims submitted to Ontario in the vicinity of the subject study area.

Further to a recent telephone discussion between Mr. David Pickles of this office and Mr. Bob Hodgins of your office on this matter and having reviewed the material you enclosed in your correspondence, ONAS notes that there are no First Nations in close proximity to, nor are we presently aware of any First Nation land claims brought against Ontario which would affect the proposed project. Therefore it is not necessary for ONAS to attend the January 25th meeting and it would be appropriate for ONAS to be removed from the project contact list.

If you require further follow-up on this letter Mr. Pickles, at (416) 326-4757, would be pleased to respond.

Thank you for providing us with the opportunity to comment.

Yours sincerely,


Tim Eger
Director

Corporate Policy and Planning Branch

cc: D. Pickles

Natural Resources



COPY

P. O. Box 7400
10401 Dufferin Street
Maple, Ontario
L6A 1S9

February 20, 1990

Our Ref: 8538.8.135

Town of Markham
8911 Woodbine Avenue
Markham, Ontario
L3R 1A1

ATTENTION: Mr. Tony Masongsong

Dear Sirs:

SUBJECT: Markham By-Pass
 16th Avenue to Highway 7
 Comments on Woodlot Resource Concerns

As per the February 9, and 20, 1990 meetings between you and my staff, we are forwarding comments on the new proposed routing of the By-pass. As requested, we have evaluated all of the stands in the area which could be potentially effected by various options in the By-pass plans.

Woodlots are habitat for mammals bird life and wildlife habitat. They contribute to groundwater regulation and aesthetics of the municipality as well as being a potentially managed supply of timber.

For the purposes of our review, we will outline the general forestry concerns in the area in conjunction with an appended evaluation of each of the five woodlots in the area.

General Concerns

As previously explained in response to a request from your Municipality, we assessed 37 woodlots "of significant potential" within the municipality, two of these woodlots outlined as 3 and 5 in the appendix were included in that report. As a result of the report, it was determined that only 7% of the municipality has forest cover, therefore, any woodlot in Markham is significant. It would be impossible to replace any of these woodlots through planting due to the ecology of the forest stands.

Any disturbance to the edge or any right of way imposition, in any of these existing woodlots, will not only cause a loss of timber, but may result in subsequent sun scald, drought and wind throw adjacent to the disruption made by the right of way, which makes even a partial shaving of a woodlot edge unacceptable.

...2



Specific Concerns

As was discussed in the meetings, there is a potential future tie in to the proposed 407 extension, and the east metro freeway proposal. It is fully understood that this cloverleaf and its tie in to the east metro freeway has not yet been finalized through any engineering design. However, it appears that woodlots 4 and 5 as outlined in the attached appendix will be impacted by the current proposed route. In view of the consideration that the engineering is not yet finalized, it is still possible to change the geometry of the Markham by-pass. Based on forestry reasons alone, there is a need to alter the proposed route to the east of the two woodlots in question. As can be seen from the descriptions of woodlots 4 and 5 in the appendix, these woodlots are diverse, high potential, good species mix and rare quality for Markham.

Based on the above, the Ministry of Natural Resources requires that the geometry of the Markham By-pass and the future tie in to the 407 be altered in such a manner as to avoid major portions of the woodlots in the area. Given the land ownership constraints at where the by-pass meets the existing highway 7, it is possible to alter the alignment of the Markham by-pass without jeopardizing the future tie in to highway 407, and have only a minimal effect on the three woodlots that could be potentially impacted. It is our understanding that negotiations to acquire lands would involve the two land holders, and that there may be options to involve Ministry of Government Services in these negotiations. It is also our understanding that the two woodlots in question also are presently owned by the Ministry of Government Services and could be acquired by the municipality for future management and preservation.

It is the position of the Ministry of Natural Resources that if it is necessary to remove any part of any of any one of the woodlots, an area double the size of the intrusion must be planted with a suitable tree species at suitable spacing.


We also note that there is a drainage ditch which runs north south and is on the eastern limits of the Markham By-Pass. This ditch empties into the Rouge River, an important cold water fishery watercourse. During construction, MNR would require that the techniques outlined in Ministry of Transportation Ontario's Siltation and Erosion Control Guideline, Chapter F be utilized to control stormwater and erosion.

Page 3
February 21, 1990
Town of Markham

We thank you for your consideration and meeting with MNR staff. Should you require further information, please contact Chris Tschirhart at (416) 832-7228.

Yours sincerely,



 C. I. Goddard
District Manager
Maple District

CT:jw

Attachment

cc: Ministry of Transportation
Attention: David P. Garner
Ministry of Government Services
Attention: Stan Krauze



Ministry of Natural Resources Ministère des Richesses naturelles

P. O. Box 7400
10401 Dufferin Street
Maple, Ontario
L6A 1S9

Ref: 8538.8.163

October 1, 1990

Fenco Engineering
 ATRIA North - Phase II
 2235 Sheppard Ave. East
 Willowdale Ontario
 M2J 5A6

Attention: I. K. Upjohn

Dear Sirs:

SUBJECT: Highway 407: Highway 48 to Highway 35/115 - Rationale for Data Collection

We are writing in regards to your letters of August 14, 1990 and September 20, and have the following comments:

Our district stream survey files contain only broad inventory data. There is no site specific data at a fine enough level of detail to aid in selecting a route for Highway 407. It is the responsibility of the proponent to collect this information.

The area of the proposed 407 is in close proximity to the Oak Ridges Moraine. It cuts across the upper reaches of all the Lake Ontario watersheds in our district. This section of the watersheds contains both the most sensitive fisheries habitat and the greatest percentage of stream habitat. This makes it imperative that a proper data collection program is undertaken in order to meet the requirements of the Federal Fisheries Act related to the habitat protection policy.

The sections of stream found in this area contain a diversity of habitat types including: spawning, nursery, juvenile and adult. It is important to know what type of habitat is contained in each section where a highway crossing is proposed. For example, spawning habitat for brook trout is closely linked to groundwater upwelling areas. A single small section with this feature may provide the spawning substrate for an entire tributary. However, if no work is carried out to check for these features, an improper route solution could wipe out an entire population of brook trout.

It is our recommendation that as a minimum the following studies be carried out:

- i) mapping groundwater upwelling/discharge areas for the stretches above, through and below each potential crossing.
- ii) a spawning survey of the entire watershed to determine where brook trout are spawning
- iii) electrofishing to document what species and life stages are using each section

... 2

<p align="center">RECEIVED</p> <p align="center">LAVALIN ENGINEERS</p> <p align="center">NCT - 9 1990</p>	
Route To:	Init.
OCT 29 90 L.K.W.	4
File:	

We reiterate our original position that fish habitat can not be destroyed. If a section of stream does not have any critical types of habitat (eg. spawning or nursery), it should be possible to mitigate or compensate for the effects of highway construction. Further to this we feel there are more specific problems in the following areas.

- a) However, in the event of a critical component being located in a section, that route may have to be rejected or a compensation package negotiated between MNR, DFO and MTO. A small amount of time and money spent on data collection at this time will prevent large complications from occurring in the future. The information presently being collected will not be sufficient to determine the input of highway construction.
- b) Many of the smaller and more sensitive tributaries will not be crossed by a bridge and it is therefore even more critical to have good data on sensitive sections of these tributaries.
- c) The issue that the land use changes may occur, does not necessarily mean that the fishery resource or our interest in it will decline.

In summary, current information is NOT adequate for route analysis and evaluation purposes. The Project Team will NOT be able to fully account for policy and technical concerns associated with route solution to DFO and MNR. This will only serve to create delays in the future.

We recommend that MNR, Fisheries Biologists meet with consultants to sort the above questions out. We suggest that you set up a meeting with Tim Rance and Chris Tschirhart at this office (416-832-7222).

Yours truly,



J. K. Barker
District Manager
Maple District

TR/CT/js

cc: T.C. Smith, Fish & Wildlife Supervisor, Maple District
R. McGregor, Regional Fish Biologist, Central Region
R. Calhoun, District Planning Coordinator, Lindsay District



Ministry of Natural Resources
Ministère des Richesses naturelles



June 30, 1992

D-8-11-3

MEMORANDUM TO:

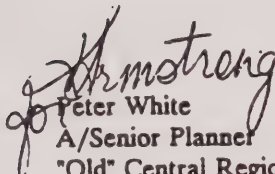
Ministry of Transportation
Transportation Planning
Central Region

ATTENTION: Pat Reynolds

SUBJECT: Highway 407/Transit Corridor Route Planning and Environmental Assessment
Review of Selected Option

Staff of the MNR Districts of Lindsay and Maple have completed their review of the Selected Option and are in favour.

We trust this is satisfactory, but should you have any questions, please do not hesitate to call.


Peter White
A/Senior Planner
"Old" Central Region
Aurora

(416) 841-9333

KA/kh





Ministry
of
Transportation
Ontario

Ministère
des
Transports

Tel: (416) 235-5482
Fax: (416) 235-4382

Central Region
Transportation Planning Section
3rd Floor, Atrium Tower
1201 Wilson Avenue
Downsview, Ontario
M3M 1J8

January 17, 1994

Mr. C. Tschirhart
Senior G.T.A. Planner
G.T.A. District Maple
Ministry of Natural Resources
PO Box 7400
10401 Dufferin Street
Maple, Ontario
L6A 1S9

Dear Mr. Tschirhart:

RE: Highway 407/Transit Transportation Corridor Route Planning Studies
Highway 48 TO Highway 35/115

RECEIVED	
JAN 19 1994	
Route To:	Int.
JAN 30 1994	47
File:	

As requested attached is background information regarding a minor alignment shift that has been made in the Town of Markham.

Attached are:

- 1/ Information received from the Town of Markham in March 1992, requesting MTO's consideration of "Environment Markham's" proposed realignment, (which became S3s the adopted shift).
- 2/ A copy of the information package sent to external agencies Sept. 14, 1992 for review and comment. It contained maps and the comparative analysis and evaluation carried out by the Ministry. Timing for responses was indicated.

"If a response is not received by October 16, 1992 the Ministry will proceed on the basis that you are in agreement with the newly selected alignment shift".

Copies were sent to the designated Ministry of Natural Resources contacts, Mr. P. White, MNR Maple and Mr. Ron Christie, GTA Branch, MNR. Mr. Christie subsequently advised by letter, Sept. 15, 1992, that his copy was forwarded to Mr. Chris Tschirhart for response, (letter attached).

- 3/ Comments received by the Ministry are attached. The only response received from the MNR was Mr. Christie's September 15, 1992 acknowledgement.

With regard to MTO's review of this proposed alignment shift it is important to recognize that numerous planning activities occurring in the East Markham area are potentially affected by Highway 407. The Highway 407 study has an obligation to make decisions in a timely manner to avoid unreasonable delays to the planning activities of others and to allow them to continue with a reasonable level of confidence. For example, establishing a recommended alignment for Highway 407 was critical to the planning of the East Markham Project in the Town of Markham. The Secondary Plan presently being prepared is based on the Ministry's decision to adopt the S3s alignment shift.

The investigation and review of the suggested alignment shift in Markham solicited the input of all potentially affected parties. Deadlines for comment were clearly established and in fact the Ministry accepted comments well after that date.

Based on an assessment of all engineering and environmental factors involved and the results of the extensive review period provided to all affected municipalities, Provincial and Federal agencies, property owners and interest groups, the Ministry announced in November, 1993 its adoption of the realignment as part of the technically preferred route for Highway 407. (I understand you have received a copy of this notice.) This alignment is now being carried forward to preliminary design which will identify the alignment and right-of-way requirements at greater level of detail and investigate specific mitigation measures.

If you require any further information regarding this decision or the review and consultation process followed please contact the undersigned. Your office will be contacted at the commencement of preliminary design to confirm the appropriate Ministry of Natural Resources contacts for that phase of the study.

Sincerely,



Patrick Reynolds
Area Manager
Highway 407 Studies - Hwy 48 to Hwy 35/115

cc: J.K. Barker - MNR Maple (letter only)
P. White - MNR Maple (letter only)
F. Leech/T. Steele (letter only)
C. Hennum (letter only)
I. Upjohn - Fenco MacLaren Inc. (letter only)

The following sites require checking to determine if appropriate fisheries data was matched to waterbodies. If MNR files were used, grid coordinates should be checked to confirm stream locations. The MTO sites as listed are mapped correctly.

MNR		MTO	
1420	tribs	1420	Brougham Creek
1400	tribs	1400	Spring Creek
1380	Brougham	1380	Duffins Creek Tributary
.....			
pg 5-23	Spring Creek (AL 1400)	-does this creek not have continuous flow?	
.....			
pg 5-20	Brougham Creek 1420 -table 5.3 lists Brougham Creek as intermittent coldwater. 'Intermittent' should be deleted as this stream flows year round		
.....			
Fisheries inventories of ponds should be provided.			
.....			
Intermittent streams should not be listed as low significance. Intermittency is an important function of aquatic systems with migratory species ie. pike, salmonid fishes etc.			
.....			
DUFFINS CREEK WATERSHED: AL1570 is found twice on one map			
.....			
An explanation of no flow vs. dry is required for each watercourse as sampling may reflect only those conditions during sampling. If sampling in an intermittent stream occurred in mid summer and is listed as dry or no flow, there may be a necessity to determine spring or fall season conditions to determine the value of the resource. An example given of an intermittent coldwater stream listed as dry is AL1460 (Urfe Creek -see table 5.2.3).			
.....			
Maps of sites that are intermittent warm and cold water are difficult to differentiate in maps of the report.			
.....			
Maps 313 and 347 should be included in the western portion of the report.			
.....			
tables are confusing re: Western and Eastern overlapping			
.....			
AL741 is not shown on map 313			
.....			
AL1376 is not shown on map 147			
.....			
Ponds should be listed in tables (in summary of existing characteristics for watersheds) for the western part of the report. They are so listed for the east.			

.....
????? AL130 in table 530 is noted as an agricultural swale, yet
is intermittent warm on map 554.
.....

Pg 4-2 Reference should be made of the Rouge River Fisheries
Management Plan, 1992. This plan should be used to
determine both the Ministry and Conservation Authority
position on resource values associated with his
watershed.
.....

Pg 4-3 Rouge River is COLDWATER
.....
include: The Rouge River is inhabited by Central Stoneroller
(Provincially significant) and is found immediately downstream of
the study area.
.....

include: Some successful reproduction of rainbow trout has been
confirmed in the Rouge River
.....

include: Brown trout are confirmed in habitats north of Steeles
Avenue in the main Rouge River
.....

the Rouge River section should be consistent with the Fisheries
Management Plan in the designation of subwatershed units
.....

Pg 4-4 fish data should be obtained for Subwatershed 2
of Little Rouge Creek "which originates in the
southeastern part of Markham"
.....

the Little rouge River is managed as Coldwater (MNR designation)
.....
Little Rouge Valley, -still have concerns with fill, steepened
valley slopes, re: river spanning valley, now that the highway
has been shifted to the South. Assessments of impacts and
mitigation measures will require additional investigation
depending on the detailed plans proposed.
.....

Pg 4-5 "The presence of blacknose dace and johnny darter
indicate that some sections of the creek have cool and
clear (.....)? Also note that on page 4-4 that
Petticoat Creek designation should be warmwater.
.....

pg 4-8 Pringle Creek -designated as warmwater stream by
Lindsay District MNR
.....

pg 5-1 5.2.1 Rouge River Watershed -both Rouge River and
Little Rouge Creek are now designated as Coldwater
systems
.....

Please note that the Hwy 407 may impact the following
zones: 6B and 6D (Rouge River) and 4C (Little Rouge
.....

Creek), as defined in the Rouge River Fisheries Management Plan. The plan identifies Zone 6B as coldwater at the lower section of the zone and there is a presence of both rainbow and brown trout. Zone 6D (AL1900) contains cold water resident habitats (upwelling and spring inputs), and serves coldwater migratory fish, also present are redbside dace and central stoneroller. Zone 4C (Little Rouge Creek and tributaries including AL1760, 1780, 1719, and 1720) contain habitat supporting rainbow trout and smallmouth bass production. Fisheries management zones should be referred to within the Technically Preferred Route document.

Table 5.1.1 -List of "Aquatic Units West" should have unit designations as listed in the revised table of 5.2.1 below. Reference material used for these designations comes from files of the Cornell Master Drainage Plan in files of MNR Maple.

pg 5-2 include Central Stoneroller

pg 5-2 Table 5.2.1 should be as follows:

Table 5.2.1
ROUGE RIVER WATERSHED STREAM CROSSINGS

NAME	UNIT #	STREAM TYPE	STATUS
Rouge River	AL1900	coldwater migratory	flow
Little Rouge Creek	AL1700	coldwater migratory	flow
Unnamed tributary	AL1794	warmwater intermittent	dry
Unnamed tributary	AL1780	warmwater	*
Unnamed tributary	AL1760	warmwater	*
Unnamed tributary	AL1761	warmwater intermittent	
Unnamed tributary	AL1720	warmwater	*
Unnamed tributary	AL1719	warmwater	*
Total # of watercourses	8		
Total # of significant watercourses	6 -AL1900,AL1700, AL1780,AL1760, AL1720,AL1719		

*intermittent flow in dry years, fish identified in watercourses, see Cornell Development file at MNR.

-
note: maps 000 and 034 will require revisions as per revised stream designations
.....
- pg 5-3 revise Rouge River (AL1900) description, and include fisheries related comments as already described above
.....
- pg 5-4 The report requires descriptions of AL1780, AL1760, AL1720, and AL1719.
.....
- pg 5-3 revise Little Rouge River (AL1900) description, and include fisheries and valley related comments as already described above
.....
- pg 5-10 Petticoat Creek- is designated as an intermittent warmwater stream. Report states that 'no potential fish habitat exists within the agricultural drainages'. WERE THE DRAINAGES SURVEYED AND IF SO WHEN? The wetland values in this creek system warrant level (1) protection. Comment should be provided re:wetlands within system that offer high potential for fisheries habitat . Bottom paragraph - eliminate 'no significance' as this suggests no value. 'Very low/no measured significance' may be a more appropriate descriptor.
.....
- There is a small wetland (1990 evaluation, class 7), North of Steeles Avenue and West of the Markham/Pickering Townline. The location of this wetland is not shown on Map 034.
.....
- pg 5-11 "Other streams crossed within the proposed highway study area that provide? have potential fish habitat include Urfe Creek, Brougham Creek, Spring Creek, and 2 unnamed tribs to Duffins Creek".
.....
- pg 5-12 In table 5.2.3 of Duffins Creek Watershed Stream Crossings, please note that the status of intermittent coldwater tributaries as either "dry" or "no flow". What is the distinction between these designations? Is the report suggesting that areas designated as no flow have seasonally isolated pockets of standing water?
.....
- pg 5-14 please note that red side dace are not restricted to just the west side of the Duffins Creek Watershed
.....
- pg 5-17 URFE -coldwater/intermittent dry. this may have flow year round.
.....
- pg 5-20 Brougham Creek - is potential coldwater
.....

-
pg 5-21 2nd paragraph, spelling "Broughman"
.....
- pg 5-23 Spring Creek- Intermittent Coldwater limited to no
fish habitat -low significance???? check???? This is a
tributary of Duffins Creek and may be of significance
during salmonid spawning seasons. Should be changed to
seasonally moderate significance. Fish data should be
collected.
.....
- ~~pg 5-24 no fish data has been provided~~
.....
- pg 5-37 Other Duffins Creek Watershed Watercourses- referred as
low significance -based on what data/criteria?
.....
We also have questions with respect to the Seaton area
at West Duffins Creek and require a more detailed
assessment of impacts relating to interchanges and
stream crossings on or adjacent to the watercourse.
A table of interchanges, perceived impacts and avenues
of mitigation would be most beneficial.
.....
- Please note that Atlantic salmon were introduced into
Duffin's Creek in 1995
.....
- please note the significance of reddsides and
stonecats for this watershed
.....
- pg 5-37 IN fisheries report dated August 22/91 reddsides
were reported in Carruthers Creek, what about now?
.....
- pg 5-50 "Lynde Creek (AL920) moderate significance (crossing
and downstream) to low significance (upstream) as fish
habitat for resident species.....moderate to high
significance as a migration route.....". This area
should be considered an area of high sensitivity.
.....
- pg. 5-57 In the summary of Environmentally significant issues
mention should also be made of hornyhead chub, stone
cat and stoneroller habitat requirements, sensitivities
to habitat and water quality and COSEWIC status
designation. The presence of these species should also
be included in tables under comments on special
features/sensitivities (Table 5.3).
.....
- Table 5.3 should follow the OMNR type habitat classification
regarding significance. Site AL 1310 is listed as of moderate
significance, however the presence of reddsides using the OMNR
type habitat system would make it of high significance.
.....

.....
Table 5.3 significance ratings: When were these aquatic units surveyed, and has their seasonal significance been evaluated? This information should be included in the comments column of the table.
.....

EASTERN SECTION

.....
pg 5-1 all Oshawa Creek tributaries should be treated as Coldwater Migratory (West and East branches)
.....
pg 5-4 East Oshawa Creek -wooden weir at AL700. Does this still exist?
.....
Oshawa Creek - areas of concern: beaver and private dams
.....
Harmony Creek - rainbow trout spawning - low survival rate due to high temperatures?
.....
pg 5-12 Bowmanville creek - salmon access may be restricted by a downstream barrier?
.....
pg 5-12 Bowmanville Creek -please note the significance of the coldwater migratory, rainbow trout run.
.....
pg 5-20 Mackie Creek -it is believed that brook trout exist at AL420.
.....
Please note that for Soper and Mackie Creeks that brown and brook trout are plentiful north of regional Road 4, rainbows are plentiful in the vicinity of Regional Road 4. There are also a number of small dams in upstream sections of these watercourses.
.....
pg 5-23 Soper Creek: rainbows are also found at this site
.....
pg 5-24 Soper Creek -'Area is moderately sensitive to disturbance due to the high degree of instability of its banks'? Would high bank instability not suggest a high level of impact sensitivity?
.....
pg 5-26 Wilmot Creek Tributary (AL320) - "siltation may also be enhanced due to a road crossing in the upstream section"????? Please provide us with more details.
.....
Wilmot Creek: it should be noted in the report that Atlantic salmon have been introduced into Wilmot Creek for the past three years
.....

AL441 is not shown on either map 454 or 487

On the Ganaraska several intermittent tributaries extend into the southern extremity of the study area, just east of Dawson Road. This requires further study. Do Wilmot Creek and Ganaraska Rivers have additional tributaries from Wilmot Creek East to Hwy 35/115? We have noted intermittent streams on topo maps.

Ganaraska River: note that there is no data for aquatic features east of AL130, please note that terrestrial evaluations were conducted, why not aquatic???

II. The following comments and notes relate to vegetation values in the Draft Final Report:

Vegetation species list in appendix, table C.2 contains duplicated listings.

Species first referenced in the text of the report should have the (Genus species) names reported in brackets, when the first common name appears.

The following vegetation species deserve comment in text as per rarity and significance:

Asteraceae	Heather Aster	(<u>Aster ericoides</u>)
Asteraceae	Coreopsis	(<u>Coreopsis lanceolata</u>)
Asteraceae	Philadelphia fleabane	(<u>Erigeron philadelphicus</u>)
Asteraceae	Gray Goldenrod	(<u>Solidago nemoralis</u>)
Fabaceae	Tick-trefoil	(<u>Desmodium canadense</u>)
Juglandaceae	Butternut	(<u>Juglans cinerea</u>)
Poaceae	Smooth Brome Grass	(<u>Bromus inermis</u>)
Ranunculaceae	Swamp buttercup	(<u>Ranunculus hispidus</u>)

*Please refer to the Natural Heritage Information Centre listings.

The following vegetation Families are reported in table C.2. The question remains: have any significant species been missed?

Asteraceae	Aster	(<u>Aster</u> spp.)???
Asteraceae	Goldenrod	(<u>Solidago</u> spp.)???
Rosaceae	Hawthorn	(<u>Crataegus</u> spp.)???
Rubiaceae	Bedstraw	(<u>Galium</u> spp.)???

*Please refer to the Natural Heritage Information Centre listings.

.....
Requires clarification: is yellow jewelweed synonymous with pale
jewelweed in the report?
.....

WESTERN SECTION

.....
pg 6-19 Please note the rarity value of the following species
for trib. to east branch, Bowmanville Creek valley
sites 448,449,451: -black walnut
-Cases ladies-tresses
.....

EASTERN SECTION

.....
pg 6-4 Common Nine-Bark (Physocarpus opulifolius) rare or
common for the study area? This species is rare in the
York and Metropolitan Toronto area according to MNR
data.
.....
pg 6-4 rare sedge (Carex aquatilio) is missing from table C.2
in appendix
.....
pg 6-4 The area containing units 1810-1813 is referred to as
the "botanically richest area in Markham with 288
species of vascular plants. It is recommended that the
topsoil be saved to preserve the seed bank.
.....
pg 6-7 710-714 designated as LSA-06 but as ESA in table 6.3.1
.....
pg 6-14 Uncommon? Yellow Jewel Weed is not listed in the
vegetation habitat record for either TA521 or TA520 yet
it is found in the text of the terrestrial portion of
the report.
.....
pg 6-41 under Ganaraska section 6.26, 'see map 557 should be 577'
.....
pg 6-3 Units 810-815 -stated that "entire area has potential
for the existence of rare plants", please elaborate.
This would suggest that further site inventory is
required.
.....
pg 6-20 Unit 449 -yellow jewelweed, is this pale jewelweed?
.....
pg 6-26 we request that a more detailed inventory be made of
TA350, Soper Creek Valley (coniferous woodland).
.....

.....
pg 6-26a? The report does not show data for TA340,360,361
re: vegetation associated with ESA S7.

.....
we also request that Stephen's Gulch ANSI/ESA Conservation Area
be examined along with background data from Mackie Creek Woods.

.....
we note that the Upper Farewell Creek has a valley bottom
intercepted by the highwater table and wetland terrain units. Do
we know what the impacts will be?

.....
pg 6-13 Farewell Creek valley System (Woodland/Floodplain)
Wintergreen, and orchids are believed to be present in
the Farewell Creek Valley. Units TA520-521 require a
comprehensive plant inventory.

.....
The level of detail seems to vary for terrestrial units. Is this
a reflection of available existing data/or of your priorities in
field inventory?

.....
pg 6-42 unit 40 - an area of high plant diversity -species
seldom or not found elsewhere along the entire
corridor,... assigned value of 2 in scoring, should it
be higher?

.....
The following comments relate to forested areas. In general the
information appears to be accurate and without field confirmation
by this ministry it appears to capture most of the vegetation
impacts. The proposed route will have a large impact on a number
of very important valley corridors. Specifically we have concern
about the following main impacts:

Units 1810-1813	Rouge River Valley System
Units 1711-1712	Little Rouge Creek Valley System
Units 1640-1642	West Duffin Creek Valley System
Unit 1370	Highly diverse upland mixed forest
Units 1270-1275	Duffins Creek valley System
Unit 1200	Mature(Old-growth) Upland Deciduous Forest)
Units 470-472	West Bowmanville Creek valley System
Units 448,449,451	East Bowmanville Creek Valley System
Units 442-443	Trib. East Bowmanville Creek Valley System
Units 220-222,230,235	Wilmot Creek Valley System
Units 180-182	Wilmot Creek Valley System and ORM Mature Woodland

Without alterations to the location of the highway and/or
specific planning and engineering these vegetation units are
likely to be negatively impacted. Modification and/or
relocation alternatives need to be addressed. Terrestrial units
1711-1712 (Little Rouge Creek), for example, will sustain

significant terrestrial and riparian loss without highway relocation. Moving the highway further south should be discussed as an option.

Spanning of valleys will be required in many portions of the Highway 407 to avoid the riparian corridor. This ministry requires the opportunity to provide recommendations/preferences for valley span structures.

.....

III. The following comments relate to wetlands in the Draft Final Report:

Wetlands data at the time of compiling this document may have been outdated if you used ministry files. This ministry is aware that additional data has been collected in the Eastern Link for Black and Farewell Creeks. We would like to stress the importance of the Black/Farewell Creek wetland complex (Class III Prov. Significant). Information collected for the links may be significant for determining offsite impacts of the East/West section of Highway 407. This ministry requests a summary of the collected information be submitted to this office.

Please note the sensitivity of the class VI wetland commonly known as Solina Bog, due to its small size. We also have concern re: impacts to the Golf Course Wetland (Class IV -Harmony Creek watershed) which is located just south of the highway right of way (ROW), north of Taunton Road.

IV. The following comments and notes relate to bird classifications and occurrences as presented in the Draft Final Report:

.....

Additional information is required re: redtailed hawk and blue heron nesting sites.

.....

All observations of the following bird species should be recorded in the text of the report , stating their significance and relationship with the habitat within the Hwy 407 corridor:

Accipitridae	Coopers Hawk	(<u>Accipiter cooperii</u>)
Accipiteridae	Red-shouldered Hawk	(<u>Buteo lineatus</u>)
Accipitridae	Northern Harrier	(<u>Circus cyaneus</u>)
Picidae	Piliated Woodpecker	(<u>Dryocopus pileatus</u>)
Picidae	Red-headed Woodpecker	(<u>Mealanerpes erythrocephalus</u>)
Troglodytidae	Carolina Wren	(<u>Troglodytes thryothorus ludovicianus</u>)*

* species observed in Rouge River Valley system (woodland/floodplain)

.....
Using the Bird Breeding Atlas of Ontario the range significance
of the above listed birds should be established.

.....
please ensure that great horned owl, and red tailed hawk are
included discussion of wildlife for the headwater area of
Bowmanville Creek. Please also identify impacts to blue birds
(Sialia sialis) as this species nests in the area.

.....
in recent years Wild turkeys have been reintroduced to the Durham
area. Turkeys are capable of flying over the highway, and under
bridges but may play a hazard to vehicular traffic. Turkeys are
often associated with river valleys/creek corridors with well
defined creek valleys. Mention of wild turkey should be included
in the report.

.....
unit 100 Mature Upland Deciduous Forest -red tailed hawk nest/
red headed woodpeckers probably breed here REQUIRES a VALUE
RATING

.....
V. The following comments and notes relate to mammal
classifications in the Draft Final Report:

.....
The following species habitat requirements should be included in
the report:

Mustellidae	Longtail Weasel	<u>Mustela frenata</u>
Soricidae	Northern Shorttailed Shrew	<u>Blarina brevicauda</u>
Soricidae	Smoky Shrew*	<u>Sorex fumeus</u>
Talpidae	Hairy-tailed mole	<u>Parascalops breweri</u>

*significant wildlife species found in Farewell Creek Valley
Floodplain

.....
VI. The following comments and notes relate to amphibian
classifications in the Draft Final Report:

.....
Table C.3 the following changes should be considered:

American Toad to Eastern American Toad?
Bufo americanus to Bufo americanus americanus?
Hyla crucifer to Pseudacris crucifer crucifer for Northern spring
peeper?
Striped Chorus Frog to Western Chorus Frog?
Green Frog should be Rana clamitans melanota?
.....

VII. The following comments and notes relate to reptile classifications in the Draft Final Report:

.....
The following reptiles require species clarification:

Colubridae	Common? Garter snake	Eastern? Redsided?
Emydidae	Painted turtle	Midland? Western?

.....
please check the Solina Woods ESA data with CLOCA to identify uncommon spotted turtle (Clemys gutlata) occurrences which are reported frequently in pools along the lower portion of the valley
.....

VIII. The following ecological concepts should be strengthened within the report:

.....
Collected biological data should be reviewed to establish corridor value in movement of plant and animal species along north/south and east/west linkages. An East/West corridor linkage is very important to maintaining ecological value as reflected in wildlife and vegetation common to the Rouge Valley and Duffins Creek watershed areas.

.....
When assessing the value of corridor linkages, consideration must be made for values well beyond the right of way of the Hwy 407. The highway design should reflect a contiguous east/west band of natural features that will permit an unimpaired movement of wildlife. North/South movement within natural features may potentially be accommodated by widened bridge spans at strategic locations along the Hwy 407 route. It is important that the aquatic and terrestrial study reflect ecological value/ and network linkages.

.....
Consideration of the Iroquois shoreline should also be mentioned within the report, and state that the associated natural features will/will not remain unblemished. Protection of the natural features associated with the Iroquois shoreline will assist in protecting corridor linkages for plants and wildlife.

.....
When examining rareness values of species one must also consider that in some instances a species may be common in one area and rare in another. Using a Regional boundary for establishing rareness value can be misleading. For example a species may be relatively uncommon in the area of study, and common in a

neighbouring region. But if the region in which you are evaluating is large, an occurrence or presence may be very significant. Rather than using municipal/regional boundaries the more accepted practice of describing value is to relate the species to site region, and site districts, and determine whether the species is in the centre or periphery of its geographical distribution. We suggest caution when interpreting rarity values in this regard.

.....
The reaches surveyed for the aquatic component differ from the terrestrial inventories with respect to the length of stream and riparian area surveyed of the R.O.W. (100 metres north and 200 metres south or east vs. 50 metres north or west and 110 metres south or east respectively). This ministry may require additional terrestrial survey work depending upon the sensitivity of the stream reaches and fisheries resources at these locations.
.....

IX. Comments relating to preliminary design.

A/MITIGATION AND COMPENSATION MEASURES

Effectiveness of mitigation and compensation measures will be reviewed by this ministry and Department of Fisheries and Oceans (DFO) to preserve habitat productive capacity and fish stocks. The potential for the project to affect fish, fish habitat and other peoples uses of fish must be evaluated by identification of potential physical disturbance, impairment of water quality (temperature change, flow alteration, release of nutrients, contamination, reduction in dissolved oxygen) and impacts to fish migration. Mitigation should be the main environmental focus in the preliminary design stage, and this ministry requests input throughout the preliminary design process, as per the MNR/MTO/DFO Fisheries Protocol, to address fisheries issues.

Data collection, inventory /analysis of existing conditions as reported in the aquatic and terrestrial documentation submitted to this office to date represents preliminary data and will require more detailed data collection particularly when we review preliminary designs and determine crossing locations/types and to mitigate impacts to migratory fish and reduce impacts to wildlife corridors. The aquatic habitat inventory does not identify the types of structures to be used, and will require a revisiting of the data during preliminary design. As per the portion of highway presently under construction this ministry will require that electrofishing be conducted at stream crossings to determine impacts and facilitate referrals to DFO for compensation. In particular we will request additional electrofishing at stream crossings where we do not agree on structure type and/or span size.

B/ WATER QUALITY

This ministry expects that specific water quality issues will be examined in detail during the preliminary design stages. Water quality treatment must be consistent with protection levels outlined in the MOEE Stormwater Management Guidelines and facilities must be designed to be consistent with the protocols of the Stormwater Management Guidelines. The level of water quality protection must reflect requirements specific to the waterbody (and/or watershed) receiving stormwater discharge.

Water quality is to include provisions for Thermal Impacts on coldwater systems from stormwater management facilities. In sensitive areas alternative methods such as infiltration should be reviewed for addressing thermal impacts. Soils should be suitable for infiltration as the proposed eastern portion of Highway 407 is in close proximity to the Iroquois Shoreline.

C/CROSSING SENSITIVITIES

As we enter the preliminary design phase this ministry requests a table of crossings/sensitivities linking with the sensitivity matrix created in the aquatic and terrestrial inventory report. This ministry will require a more detailed assessment of impacts relating to interchanges and stream crossings on or adjacent to the watercourse. A table of interchanges and crossings, perceived impacts and avenues of mitigation will be essential for an expedient review.

D/MINIMUM REQUIREMENTS FOR BUFFER ZONES

MTO should also be aware of a 1994 report regarding buffer zones along stream corridors prepared by biologists of this the Maple District of OMNR. This position paper outlines the minimum requirements for buffer strip widths for maintaining the integrity of stream/river corridors. Meander belt width is a consideration for determining buffer widths.

E/VALUE ADDED PHILOSOPHY: EXISTING CONDITIONS vs. REHABILITATIVE POTENTIAL

MTO has produced data of High/moderate/low potential habitat which is based upon existing conditions. In the preliminary design stage this ministry will also be looking to achieve what is in the best interest for rehabilitation within each system.

F/TYING TOGETHER DISCIPLINES

MNR wants to see fisheries, engineering and net effects data tied together. This will reflect negotiations in preliminary design.

G/IMPORTANCE OF ELECTROFISHING MINOR SYSTEMS

Because many minor drainage systems may potentially have culverts the impacts associated with disturbance of these natural watercourses should be evaluated by electrofishing prior to selecting the construction design. There is a need to focus more data collection on tributaries and stress the importance of small streams in the overall quality of stream systems. Levels of significance should reflect values of intermittency, nutrients, existing culverts, culvert impacts and water quality. For example 80% of baseflow comes from the Oak Ridges Moraine for Bowmanville Creek. Hydraulic impacts to fisheries resources should be addressed in preliminary design to determine the best structures with least impacts to groundwater, especially in areas of small tributaries.

H/ THE NEED FOR ADDITIONAL INFORMATION DUE TO INCONSISTENCIES IN DATA

As we go to detailed design we will request additional information to compensate for the inconsistencies re: timing of fish surveys used for baseline data.

On October of 1990 this ministry indicated to MTO that in correspondence that detailed info. re: coldwater stream crossings would be required. In November of 1990 correspondence from this ministry indicated to MTO that fisheries data were deficient to assess route selection criteria. Since then MTO has arranged for the mapping of fisheries data to determine sensitivities. Our office has some concern with this approach as in some instances fisheries data may be being outdated as per Lynde Creek which was last surveyed for fish in 1974.

I/GROUND WATER

MTO has stated that re: groundwater upwelling that when profiles permit, most areas identified as high potential groundwater will be spanned. Upwelling/seepage areas should be tabled and mapped. Special engineering design and construction approaches may be required to prevent negative environmental impacts especially where there are erodible soils with slopes greater than 5%. This ministry would like input to BMP's at these locations.

This ministry still has concerns over groundwater and recharge and storage functions for the northeast portion of the study area (Lake Iroquois Shoreline intrusion southeast of Tyrone).

J/BARRIERS

Barrier effects should also be addressed in preliminary design.

Interchanges.
K/CLOVER LEAFS

This ministry would like to provide comment on clover leafs. In certain instances detailed impact assessments will be required particularly in areas such as for the Rouge Valley.

L/ROAD RE-ALIGNMENTS (Local)

It is anticipated that a number of local roads will be realigned to permit construction the Highway 407. Information will be required to assess potential impacts.

M/HABITAT PROTECTION -COMPENSATION SITES/LIST REQUIRED

Unlike the portion of Highway 407 presently under construction which offers many opportunities for stream/river enhancement in areas of the highway crossings, there will be a definite need for establishing a list of compensation sites well in advance of the highway. More significance will be placed on protection vs. enhancement due to water course sensitivities.

As per the fisheries protocol, where project effects are anticipated, mitigation and/or compensation measures will be employed. Where necessary, some field studies may be undertaken to define mitigation and/or compensation details.

Scoping of fisheries studies may be required to determine the need for harmful alteration based on the sensitivity of the waterbodies and construction/design impacts. MNR in consultation with MTO should determine areas requiring further fisheries information.

M/MONITORING HIGHWAY IMPACTS ON FISHERIES

There will be a need for monitoring especially on small tributaries to determine long term effects. Invertebrate sampling should be used to determine a baseline for monitoring water quality, and should be begin prior to construction. Sensitivity by aquatic systems to road runoff of deicing chemicals, nickel, chromium, iron, oil and rubber particulates deserve consideration.

Monitoring of sites after construction will also be required to determine impacts on fisheries habitat (river banks, hydraulics, fluvial geomorphology). Should negative impacts be determined the contractor/MTO should be prepared to provide on site compensation/ reconstruction and mitigate for impacts.

To monitor the impacts of the proposed highway construction/post construction this ministry believes that it would be most beneficial for MTO to participate in a partnership with MNR, MOEE, and university researchers to develop the necessary sampling protocol. This ministry collects fisheries data at a number of index sample stations in watersheds being crossed by the proposed highway 407. Pooling resources of agencies with common research direction will provide the necessary interrelationships between water quality, benthic invertebrates, fisheries, and stream morphology, to address bridge impacts, and stormwater affects to aquatic systems from highway development.

N/MITIGATION FOR WILDLIFE

Earlier correspondence from your ministry indicated that mitigation for wildlife would be a consideration that would be addressed in detailed design. This ministry requires that considerations for wildlife be established in the preliminary design phase. Although only a few species of wildlife may be accommodated through alternative means of design, considering the impacts to wildlife corridors relative to constrictions at stream/river crossings this ministry may request specific works to accommodate wildlife. Reference should be made to the Lake Ontario Greenway Strategy to preserve the integrity of valley systems. Culvert installation and tunnelling effects should be addressed in preliminary design as previously mentioned in the July 24/90 minutes prepared by Parker and Hale re: 407 fisheries report.

O/CONSTRUCTION PRACTICES

Chapter F of MTO's siltation and sedimentation construction guidelines must be strictly adhered to as the base soils become more progressively silty along the (geological) Lake Iroquois Shoreline, accounting for the need of more stringent controls.

P/RESOURCE USERS

Wildlife users were not referenced in your report. It is important that local naturalist groups (ie. FON) be consulted with respect to any specific bird count or observation areas that may be impacted by the highway. Long term data information is important to both the naturalist/bird observer groups and the Canadian Wildlife Service.

' Will the public have access and parking for fish and wildlife viewing/hunting opportunities, on highway lands?

X. MTO Public Relations Opportunity: Tree Planting And MNR Stewardship Program

Forests provide important habitat for rare species of plants and wildlife, as well as having a cooling influence on local coldwater streams. For this reason, woodlots/forests that are removed should be replaced.

In areas where fish and wildlife impacts are to be affected by removal of forest cover this ministry will request MTO assure that there will be a replacement planting similar to those areas of tree/cover removal. Species selection should be made with MNR staff to provide for an agreeable approach to reestablishing vegetation within each affected watershed. In many instances this ministry may request that tree planting be conducted along stream corridors presently lacking riparian cover and may require plantings on properties outside the Highway 407 right of way.

This ministry will endeavour to provide a stewardship coordinator(s) to assist MTO in land stewardship/partnership relations with potential landowners tree recipients. This will provide an excellent platform for MNR to promote the new land stewardship initiative and ensure that the best possible areas are selected for replanting.

XI. Construction Timing Guidelines

Construction timing must be consistent with guidelines outlined in the District Fisheries Management Plan for Maple District.

XII. Work Plan

A formalized work plan relating to preliminary design review for mitigation/compensation should be prepared.

XIII. Participation by Federal Regulatory Agencies.

This ministry cannot give comment re: federal lands without consultation with the Department of The Environment (DOE). Is DOE presently commenting on any part of this document? At what point will the Canada Environmental Assessment Act (CEAA) be triggered? A single referral to DFO or Department of Transport would trigger CEAA, and since the highway is under one EA and is greater than 50 km in length, a Comprehensive federal survey under CEAA may be required.

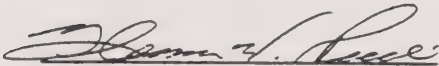
XIV. Comments/Future Submissions/Dialogue

All information contained herein was compiled in the spirit of working for a better Ontario. Biologists participating in this

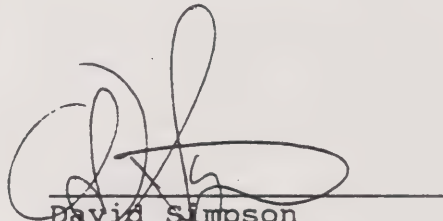
process acknowledge that highways are an important part of the economic development of Ontario, and also recognize the need to protect Ontario's Natural Resources. Because information that is presented during an EA is not necessarily conclusive at each stage of submission it is with great interest that this ministry looks forward to participation with interest groups in EA review. MNR's comments reflect a review of the information at hand, and reflect the knowledge of the area by each of the reviewing staff, and information presented. MNR welcomes additional information, no matter who is the contributing agency, person(s), and has the right to adjust comments as issues present themselves throughout the EA process ahead.

Any errors or omissions should be referred to Dave Ross (HWY 407 biologist) at 705-832-7216. Mr. Ross will arrange meetings between MTO and the appropriate MNR staff to address concerns relating to this EA comments submission.

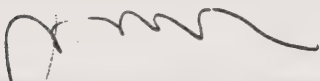
Sincerely,



Glenn Price
Area Supervisor
Durham Area Team



David Simpson
Area Supervisor
York South Area Team



J.W. Barker
District Manager
Maple District

/DJR

cc. Tim Rance, Biologist (Durham A.T.)
Theresa Cunningham, Biologist (Durham A.T.)
Ken Elliot, Forester (Durham A.T.)
John Osmok, Stewardship Coordinator (Durham A.T.)
Mark Heaton, Biologist (York South A.T.)
Glen Hooper, (District Ecologist)



Ministry of
Natural Resources

Ministère des
Richesses naturelles

P.O. Box 7400
10401 Dufferin Street
Maple, Ontario
L6A 1S9

July 30, 1996

ECOPLANS
2655 North Sheridan Way
Mississauga, Ontario
L5K 2P8

Attention: Bob Hodgins, Manager

SUBJECT: **DRAFT STAKEHOLDER CONSULTATION PROCESS (DSCP)
HIGHWAY 407 MARKHAM ROAD EASTERLY**

As per your recent communication with this office this Ministry
requires attention to the following:

**DSCP: Attendance at these meetings will change depending upon the
issues being addressed, but generally will include MNR and MTRCA.**

MNR should be informed of all meetings involving the Conservation
Authority with MTO/Contractor. Similarly the Conservation
Authority should be given the same consideration, when MNR meets
with MTO. It is important that regulatory agencies work together
to resolve issues relating to the highway.

**DSCP: DETAILED DESIGN...nature of follow up monitoring will be
required.. -and-**

**DSCP: FOLLOW UP. Determine the need for post-construction
monitoring.**

Compliance monitoring is often a requirement of Federal Fisheries
Act Approval. It is recommended that MNR, MTO, MOEE, DFO, DOE
meet to discuss the compliance monitoring issue. MTRCA should
also be invited to participate in the dialogue particularly with
reference to Stormwater Management related issues. A compliance
monitoring strategy for the highway should be developed for
application to sensitive watercourses now, prior to design of the
highway.

**DSCP: DOCUMENTATION OF THE DESIGN PHASE...design and construction
reports will be made available to the stakeholders prior to the
commencement of construction.**

Final reports will require approval from MNR for environmental
related issues. MNR will not provide engineering review. The
local Conservation Authority will provide engineering comment.
Design of the highway must conform to regulation outlined in the
Lake and Rivers Improvement Act.

DSCP: ATTACHMENT A. PROPOSED OBJECTIVES. Bridges may be considered for other crossing locations where warranted....

Please qualify where warranted. The Ministry of Natural Resources (MNR) will refer issues relating to fisheries habitat loss to DFO. The decision qualifier where warranted shall be determined only after a consultation process that includes MNR.

DSCP.....submit compensation plans to DFO for Authorization.

Plans are also to be provided to MNR. MNR will make a formal project referral to DFO. The proponent (MTO/contractor) will submit an Application for the Authorization of Fish Habitat to DFO with Plans. All information will be reviewed by MNR prior to delivery to DFO. A Letter of Intent will be prepared by the proponent and MNR. It will be the proponents responsibility to ensure delivery of documents to DFO.

DSCP: STORMWATER MANAGEMENT: When warranted and possible, design stormwater management ponds to detain a 25mm storm event for 24 hours.

when warranted and possible...what will guide this decision process? The MOEE guidelines have a minimum drainage area used in determining the need for stormwater facilities. In many instances a 25mm (2hour) storm with 24 hour detention will be suitable for stormwater treatment. As most watercourses East of Highway 48 are parts of coldwater systems that sustain resident and migratory coldwater species of fish, it should be noted that the proponent will be instructed to guarantee Level 1 protection at certain locations. It should be noted where MNR habitat typing indicates Type I habitat Level 1 stormwater protection as per MOEE Guidelines is warranted.

In certain cases additional detention time may be required at stormwater facilities for additional settling of suspended sediments. The local conservation authority will indicate where 48 hour protection is required due to highly erosive soils.

Stormwater issues require further discussion among MNR, MTRCA, DOE and MTO.

DSCP: Where feasible, do not discharge bridge runoff directly to watercourses.

This ministry will request that bridge runoff outlet to stormwater ponds, and if stormwater ponds are not present that bridge runoff be outletted to drainage swales before entering the watercourse.

DSCP: Design BMP's to avoid infiltration.

This ministry will request that the groundwater infiltration option be reviewed to regulate water temperature along the highway corridor. MOEE should be contacted to determine if at specific locations ground water infiltration may be a suitable option. If groundwater infiltration is not permitted, a clay lined infiltration outlet channel from stormwater facilities may be a suitable alternative to emulate the cooling effects of groundwater infiltration.

.....

MNR attended a meeting at MTRCA with the Rouge Park Alliance (RPA) and Save the Rouge (SRV) on July 5, 1996 where a number of questions relating to a Highway 407 stakeholder process were discussed. Although the process was not discussed in detail each of the parties appeared to have specific concerns. The following comments and suggestions may assist you with the stakeholder process:

DSCP: THE TECHNICAL ADVISORY CONTACTS: committed to the involvement of affected stakeholders in the design process

It is recognized that the predominant factor that will determine the limits of negotiation is often cost. What approach will be taken by MTO to address concerns in light of associated costs? Will a weighting system be instituted to evaluate options and address concerns in existing management plans prepared by MNR and MTRCA?

DSCP: THE DESIGN PROCESS. the preliminary design and detailed design phases may be combined as an evolving process.

A table of objectives and review requirements should be prepared by MTO/contractor and provided to regulatory and commenting agencies prior to the undertaking. Schedules outlining environmental review, and outstanding screening/data requirements, should be prepared on a regular basis to provide realistic opportunities for input and comment. Regulatory agencies will also require advanced notice to process approvals efficiently.

Detailed design should not precede preliminary design for individual projects along the highway, without prior consultation with the regulatory/review agencies.

DSCP: Vegetation

Please also include: salvage where possible, (after consultation with review agencies/interest groups), vegetation for transplanting.

DSCP: Spills

Although spills may be the responsibility of the owner/carrier of the spilled material, stormwater facilities can be designed to have an emergency shutoff valve to minimize spill spread. This should be a consideration in stormwater facility design.

.....
A simple change in wording should also be considered for the following statements:

DSCP: The design team may meet with the technical advisory contacts on a regular basis

Please consider... WILL meet on a regular basis.

DSCP: ...the technical advisory group will be consulted as necessary during the construction phase should issues arise that need discussion or resolution.

Please consider the elimination of 'as necessary'.

DSCP: Where possible, avoid the placement of piers within the watercourse channel.

Has MTO not already indicated that piers will not be placed in the water at the Rouge River, Little Rouge Ck, and West Duffins Ck (March 13 meeting at CCIW)?

DSCP: Where practical, minimize the placement of fill below the regional flood level.

What will determine the qualifier: Practical?

DSCP: conduct ongoing consultation with affected agencies during the design and construction phases as necessary.

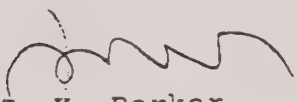
as necessary is a loose term and should be described in more detail... consider changing "as necessary" to "in order to obtain the appropriate approvals, and input from concerned interest groups".

5

Please also note that MNR has been invited to meet with the Stakeholders (MTRCA, Rouge Alliance, Save the Rouge) on a regular basis, to hear discussions of Stakeholder issues. The Stakeholder group will report to MTO as a committee, and MNR will comment separately. Please notify this office if further discussion is required regarding this potential arrangement.

Should you have any questions, please contact Dave Ross, Highway 407 Biologist at 1-905-832-7216.

Sincerely,



J. K. Barker
District Manager
Greater Toronto Area District

/DJR

cc. T.E. Farrell, MNR
P. Jankowski, MTO
D. Marneau, MTO
P. Reynolds, MTO
D. Haley, MTRCA
W. Hyatt, DFO
R. Dobos, DOE

DEC 10 1996

Ministry of
Natural Resources

Ministère des
Richesses naturelles

P.O. Box 7400
10401 Dufferin Street
Maple, Ontario
L6A 1S9

December 12/96

ECOPLANS
2655 North Sheridan Way
Mississauga, Ontario
L5K 2P8

Attention: Bob Hodgins, Manager

SUBJECT: DRAFT STAKEHOLDER CONSULTATION PROCESS (DSCP)
HIGHWAY 407 MARKHAM ROAD EASTERLY

On December 10 and 11, this office received: MTRCA comments on the Draft Stakeholder Consultation Process, MTO's response addressing MTRCA's concerns, and the Draft EA document.

This ministry acknowledges that the Stakeholder Consultation Process (SCP) (November, 1996) includes requests originally made by MNR in a review of an earlier draft (MNR's July 30, 1996 comments).

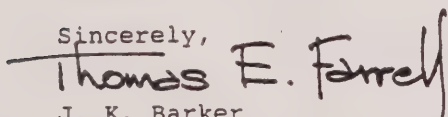
The need for addressing wildlife/corridor values is mentioned in the SCP but is not detailed. The Draft EA (pg 6-32) provides a list of principles requiring further consideration for evaluating wildlife and corridor values as earlier requested by MNR.

The appropriateness of the Stakeholder Consultation Process and wildlife/corridor values will be reviewed by this ministry, in context of the EA, and included in MNR's comments of MTO's Draft EA submission.

Should you have any questions, please contact Dave Ross, Highway 407 Biologist at 1-905-832-7216.

Seasons greetings.

Sincerely,

for 
J. K. Barker
District Manager
Greater Toronto Area District

/DJR

cc. P. Jankowski, MTO
D. Marneau, MTO
P. Reynolds, MTO
D. Haley, MTRCA
T.E. Farrell, MNR

G. Price, MNR
T. Smith, MNR
T. Rance, MNR
M. Heaton, MNR

Northern Development and Mines



Ontario

Ministry of
Northern Development
and Mines

(416) 965-1669

Ministère du
Développement du Nord
et des Mines



June 14, 1989

Mr. Patrick J. Reynolds
Senior Transportation Planner
Transportation Planning Section
M.T.O. Central Region
5000 Yonge Street
Willowdale, Ontario
M2N 6E9

Dear Mr. Reynolds:

Re: Route Planning/EA For Proposed Highway 407

Thank you for your letter of June 6, 1989. The Ministry of Northern Development and Mines' geographical mandate does not include the Regions of York and Durham. Therefore, we feel that it is not necessary for us to review this report or receive further material on the environmental assessment.

Sincerely,

Ken Sharratt
Manager, Corporate Policy

PR/yd

CHE

Ontario Realty Corporation



Ontario Société
Realty immobilière
Corporation de l'Ontario

Property Development Division

Real Estate Branch

15th Floor, 777 Bay Street
Toronto ON M5G 2E5
Tel.: (416) 585-6741
Fax: (416) 585-7577

Division de l'aménagement des biens

Direction de la gestion immobilière

15e étage, 777 rue Bay
Toronto ON M5G 2E5
Tel.: (416) 585-6741
Fax: (416) 585-7577

February 15, 1996

McCormick Rankin
2655 North Sheridan Way
Mississauga, Ontario
L5K 2P8

Attention: Mr. R. C. (Bob) Hodgins, B.Sc. (Ag.), M.B.A.

Dear Mr. Hodgins:

SUBJECT: Environmental Issues
Highway 407 East of Highway 48
Your Project #3199

Thanks for the opportunity to comment on the proposed Highway 407 development east of Highway 48.

As you know, the Ontario Realty Corporation (O.R.C.), is a significant property owner in the vicinity of the study area associated with the above noted proposal.

While O.R.C. does not have specific concerns or plans to register with the proposed project, comments may be expected from civil servants associated with portions known as Cornell & Seaton.

Given the reduced time frame for developing your proposal, O.R.C. supports the exemption approach for dealing with the Environmental Assessment Act requirements.

Please keep me posted on developments associated with the proposed undertaking.

Yours truly,

Ross Farewell
Environmental Planner

cc: Gord Laschinger

CRS

**Solicitor General &
Correctional Services**



Ontario

Ministry of Correctional Services
Ministère des Services correctionnels

2001 Eglinton Avenue East
Scarborough, Ontario
M1L 4P1

2001, avenue Eglinton Est
Scarborough (Ontario)
M1L 4P1

May 3, 1990



Mr. P. Reynolds
Senior Transportation Planner
Transportation Planning Office
Ministry of Transportation
3rd Floor, Atrium Tower
1201 Wilson Avenue
Downsview, Ontario
M3M 1J8

Dear Mr. Reynolds:

Re: Highway 407 from Highway 48 to Highway 35/115

I am in receipt of your letter of April 20, 1990 concerning the above-noted subject. Having reviewed the contents it appears that the project does not impact on the operations of the Ministry of Correctional Services. Therefore, there would appear to be no benefit in us continuing to be consulted in the development of this project.

Thank you for providing us with the opportunity to review the matter to date.

Yours truly,

Neil T. McKerrell
Executive Co-ordinator
Offender Programming Branch

/jm



2655 North Sheridan Way
Mississauga, Ontario
L5K 2P8
Phone: (905) 823-4988
Fax: (905) 823-8503

Ministry of the Solicitor General and Correctional Services
Accommodation and Capital Planning Services Section
777 Memorial Ave.
Orillia, Ontario
L3V 7V3

January 30, 1996

Attn: Mr. Blake Francis
Manager

Dear Mr. Francis:

RE: HIGHWAY 407 EXTENSION - ENVIRONMENTAL ASSESSMENT

A couple of weeks ago, I spoke with you regarding the need to involve your Ministry in the above study. At that time you indicated that you did not need to be involved in the study because you have no affected facilities. We are proceeding on this basis and will not be involving you any further. If this accurately reflects your position, could you please sign the bottom of this letter and fax a copy back to me at 905-823-8503, so that our files are complete. If this is not correct, could you please advise me in writing of your position. Thank you for your assistance and if you have any questions regarding this matter please do not hesitate to give me a call.

Yours truly;

ECOPLANS LIMITED

A handwritten signature in cursive script, appearing to read "Bob Hodgins".

Bob Hodgins, BSc (Ag), MBA
Manager, Mississauga Office

I agree that this accurately reflects our position on this Project:

A handwritten signature in cursive script, appearing to read "B. A. Francis".

Signature, Ministry of the Solicitor General
and Correctional Services

96.01.31

Date

Treasury & Economics



Ontario

Ministry of
Treasury and
Economics

Ministère du
Trésor et de
l'Économie

Queen's Park
Toronto, Ontario

Queen's Park
Toronto (Ontario)

SEP 16 1991

Sectoral and Regional Policy Branch
4th Floor, Frost Building North
(416) 965-3792/FAX: (416) 324-6760

September 5, 1991

Mr. I.K. Upjohn
Principle Planner
Fenco Engineers Inc.
Atria North - Phase II
2235 Sheppard Avenue East
Willowdale, Ontario
M2J 5A6

Dear Mr. Upjohn:

I have received your recent letter enclosing a plan of the preferred route and alternatives for Highway 407 from Highway 48 to the Whitby/Oshawa boundary.

The Ministry of Treasury and Economics has no program responsibilities which would affect the siting of this project or an assessment of its impact on the environment. Accordingly, there is no need for you to provide further documentation on this project. Thank you for removing us from your distribution list.

Sincerely,

Carol Harris Lonero
Manager
Economy & Environment Unit

Copy: K. Sadlier-Brown

**Metropolitan Toronto
Region Conservation/
Rouge Park Alliance**



the metropolitan toronto and region conservation authority

5 shoreham drive, downsview, ontario, m3n 1a4 (416) 661-6600 FAX 661-6898

October 31, 1991



Patrick Reynolds, Project Manager
Transportation Planning Section
Ministry of Transportation
3rd Floor, Atrium Tower
1201 Wilson Avenue
Downsview, Ontario
M3M 1J8

Dear Mr. Reynolds:

Re: Highway 407 from Highway 48 To Whitby/Oshawa Boundary
Route Planning and Environmental Assessment

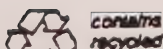
This will acknowledge the letter of August 23, 1991 from Ian Upjohn, Fenco Engineers Inc., and the request for comment with respect to the above study. We appreciate the process of evaluation that you have undertaken to choose the preferred alignment and the rationale for its choice.

The Authority will continue to be interested in future phases of this project as it proceeds to preliminary design, particularly with respect to any potential impacts on watercourses. We note that it is proposed to alleviate negative impacts on fisheries and valleylands by the use of bridges, rather than culverts, at the major watercourses. We will also be interested in your proposals for the crossings at smaller watercourses as these are the tributary reaches and their protection and maintenance is important to the integrity of the overall watershed.

We note reference to archaeological significance. Authority studies have shown high potential for such resources in conjunction with river valley systems, as these were important transportation routes and settlement sites. Site specific investigations will, presumably, occur as a part of subsequent phases of this project.

The Authority's E.S.A. study was completed in 1982 and, due to funding limitations, has not been updated. The information in the study does require updating, given its age, and extension, as the original study did not include all of the Authority's area of

...../2



Patrick Reynolds

-2-

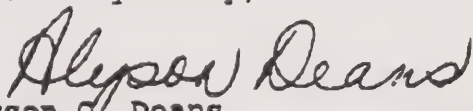
October 31, 1991

Re: Highway 407 from Highway 48 To Whitby/Oshawa Boundary
Route Planning and Environmental Assessment

jurisdiction. We anticipate commencing this work in 1992, subject to funding approval. Site specific reviews, particularly within the area that could be affected by the preferred alignment, are required.

We appreciate being provided the opportunity to, again, provide input to and comment on the planning for this project. We will continue to be involved as it progresses.

Yours very truly,



Alyson Q. Deans
Manager, Corporate Planning & Analysis
(Extension 269)

ACD/bb

cc. I. Upjohn, Fenco Engineering Inc.
D. Haley
D. Lewis



the metropolitan toronto and region conservation authority

5 shoreham drive, downsview, ontario, m3n 1s4 (416) 661-6600 FAX 661-6898

October 15, 1992

Patrick Reynolds, Project Manager
Transportation Planning Section
Central Region
Ministry of Transportation
3rd Floor, Atrium Tower
1201 Wilson Avenue
Downsview, Ontario
M3M 1J8

Dear Mr. Reynolds:

RE: Proposed Alignment Shift - Highway 407
Little Rouge Creek

I have asked staff to review the above proposed alignment shift, as identified and discussed in correspondence from Ian Upjohn, Fenco Engineers Inc., dated September 8, 1992. .

It appears that the new alignment will have less impact on the existing terrestrial resources. While this area does not currently contain habitat resources deemed as significant as those in the vicinity of the original S3 crossing, the Authority would be encouraging site rehabilitation and restoration work, following construction, to enhance the quality of this segment.

We note that the S3S alignment requires significantly more fill than S3 and would like further clarification regarding the potential impacts/intrusion of the fill on the valley of the Little Rouge Creek. Don Haley, ext. 226, at this office should be contacted to discuss this matter.

I trust these comments will be of assistance and thank you for keeping the Authority advised of the progress of this project.

Yours very truly,

(Mrs.) Alyson C. Deans
Manager, Corporate Planning & Analysis
(Extension 269)

ACD/bb

cc. I.K. Upjohn, Fenco Engineers Ltd.
D. Haley
D. Lewis



FENCO

1 December 1992

Mr. Don Haley
Metropolitan Toronto and Region Conservation Authority
5 Shoreham Drive
Downsview, Ontario
M3N 1S4

Fenco Engineers Inc.
Atria North - Phase II
2235 Sheppard Avenue E.
Willowdale, Ontario
Canada M2J 5A6

Telephone: (416) 756-3400
Fax: (416) 756-2266

Dear Mr. Haley :

**HWY 407/TRANSIT CORRIDOR ROUTE PLANNING
HWY 48 TO WHITBY/OSHAWA BOUNDARY
W.P.282-86-01
ALIGNMENT S3S IN MARKHAM**

Further to Alyson Deans' correspondence of October 15, 1992 and our conversation of November 26, 1992 in which you suggested a need to review your comments to Mrs. Deans regarding impacts/intrusion on the Little Rouge Valley, we can provide the following clarification.

The written summary in the information package sent to the MTRCA notes under the factor 'Geometrics-Vertical Alignment' that, in fact, it is the original Alignment S3 which would require the greater amount of fill. The Little Rouge Creek valley is narrower and better defined at the new alignment S3S crossing location and lends itself better to reducing the fill placed in the valley. At a very conceptual level, we have determined that the lengths of the structures (bridges) for the valley crossing on S3 and S3S would be 210 m and 190 m, respectively. Further consideration will be given to this issue during the structural design within the preliminary design phase to determine the optimum structural arrangement in consultation with MTRCA.

Please call me at your earliest convenience to confirm your understanding of the implications of each crossing option and in order that the Authority's comments may be finalized.

Yours very truly,
FENCO ENGINEERS INC.



I.K. Upjohn, M.C.I.P.
Principal Planner
Environmental Assessment Services
Transportation

cc. P. Reynolds, MTO
T. Steele, MTO
A. Deans, MTRCA

53425-35-MTRCA.LTR



Member of SNC-LAVALIN



the metropolitan toronto and region conservation authority

5 shoreham drive, downsvew, ontario, m3n 1s4 (416) 661-6600 FAX 661-68

1992 12 31

Mr. Ian UpJohn
Fenco Engineering Inc.
Atria North - Phase II
2235 Sheppard Avenue E.
Willowdale, Ontario
M2J 5A6

Dear Sir:

RE: PROPOSED ALIGNMENT SHIFT, HWY. 407 AT LITTLE ROUGE CREEK


Further to your correspondence of December 5, 1992, and our subsequent telephone discussion, I would like to clarify the Authority's comments of October 15th, on the proposed alignment S3S.

The Authority's October 15th comments relating to the impacts of fill on the valley with respect to alignment S3S were based upon the plan documents submitted. Based on these plans and without a vertical profile, it appeared that the grade separation requirement for alignment S3S being closer to the valley than that for S3 would result in a higher fill for the highway at the river crossing. With a narrow valley cross-section and potentially a higher highway fill, we were concerned about the possible impacts of fill on the valley system at this location. Our concerns were related to both the impact on the valley features as well as potential fill within the Little Rouge floodplain and any hydraulic impacts. The floodplain within this reach of the Little Rouge appears to span the valley and could be impacted by fill required for the structure.

These were the items that our letter of October 15th was requesting clarification on with respect to the proposed alignment 535.

Should you require any further information relating to our comments, please call.

Yours truly,


D. R. Haley, P. Eng.
Project Engineer
Engineering and Development Section
Water Resource Division

DRH/gds

cc: Alyson Deans
Pat Reynolds, MTO

RECEIVED

DEC - 6 1992

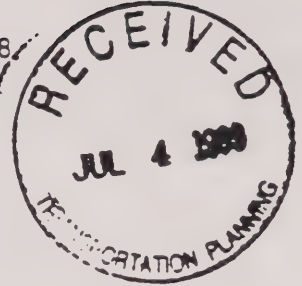
1992 DEC 10 11:05 AM '93 I.K.U.



the metropolitan toronto and region conservation authority

5 shoreham drive, downsvew, ontario. m3n 1s4 (416) 661-6600 FAX 661-6898

1989.06.22



Patrick J. Reynolds
Senior Transportation Planner
Transportation Planning Section
Ministry of Transportation
Central Region
3rd Floor, Atrium Tower
1201 Wilson Avenue
Downsview, Ont.
M3M 1J8

Dear Mr. Reynolds:

Re: Route Planning/Environmental Assessment
Highway 407-Highway 48 to Highway 35

This will confirm our telephone conversation and that I will be the Authority's contact with regard to the above project.

In order to ensure all Authority input and comment is coordinated, it would be appreciated if your consultants would direct all requests to my attention.

We appreciate being advised of your study and will provide information regarding our specific interests, as required.

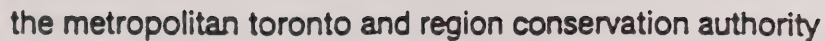
Yours very truly,

A. C. Deans (Mrs.)
Planning and Policy Coordinator

ACD:L

cc: J. Nuttall, MTO, Environmental Planning & Design
5th Floor-Atrium Tower, 1201 Wilson Ave., Downsview, Ont.

Mr. D. Haley, MTRCA
Mr. P. Wigham, MTRCA



5 shoreham drive, downsvlew, ontario, m3n 1s4 (416) 661-6600 FAX 661-6898

8 May 1990

Mr. I.K. Upjohn, MCIP
Principal Planner
Environmental Services - Transportation
Fenco Engineers Inc.,
Atria North - Phase II
2235 Sheppard Ave. East
Willowdale, Ont.
M2J 5A6

Dear Mr. Upjohn:

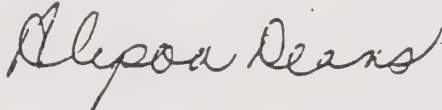
Re: Highway 407 - Highway 48 to Whitby/Oshawa
Route Planning & EA Study (WP 282-86-01

Mr. I.K. Upjohn
Page 2
8 May 1990

The evaluation criteria appear to recognize those issues of interest to the Authority. We note, however, that the mapping provided appears preliminary and that we will provide further comments as this information proceeds.

I trust these comments are of assistance and plan to attend the External Team information session on May 15, 1990 from 10 a.m. to noon at the Markham Community Centre.

Yours very truly,



Alyson C. Deans, Manager
Corporate Planning and Analysis

ACD:L

cc: MNR, Maple District
D. Haley, MTRCA
B. Hindley, MTRCA



the metropolitan toronto and region conservation authority

5 shoreham drive, downsvew, ontario, m3n 1s4 (416) 661-6600 FAX 661-6898

FENCO ENGINEERS	
J. Upjohn	
JUN 27 1990	
INITIALS	
June 25, 1990	

Mr. I.K. Uphohn, M.C.I.P.,
Principal Planner,
Fenco Engineers Inc.,
Atria North, Phase II,
2235 Sheppard Avenue East,
WILLOWDALE, Ontario
M2J 5A6

Dear Mr. Upjohn,

Re: Highway 407 - Highway 48 to Highway 35/115

Further to the external team meeting of May 17, 1990, I requested staff to review the current alternatives and identify any concerns.

Specific to selection of a preferred alignment, we note the following:

1. the watercourse crossings associated with the more northerly alignment would be preferable as the valleys are narrower;
2. the Authority owns Green River Park on the West Duffin Creek. It appears that the northerly alignment will cross this property. Given that this property lies within the valley and that we have recommended that all crossings of the Duffin be designed as high-level and incorporate strict measures to protect the river's environmental resources, the direct impacts would be addressed as part of the design.
3. the Authority, as a part of its Greenspace Strategy, has recommended a regional trails system with north-south routes along the river valleys and east-west links along the waterfront, moraine and Parkway Belt. The high-level crossings of the watercourse will maintain the valley land component of this proposal and we would request that the opportunity for the east-west link, in association with your project, be taken into consideration.

- 2 -

Mr. I.K. Uphohn, M.C.I.P.,
Principal Planner,
Fenco Engineers Inc.

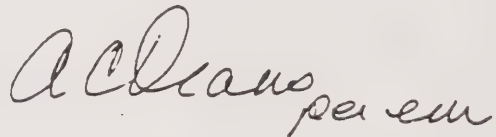
June 25, 1990

Once more detailed design work is being prepared, the following concerns will be addressed:

- . sediment control measures
- . rehabilitation/replanting
- . fisheries habitat and wildlife corridor protection.

I trust these comments are of assistance and appreciate the opportunity to provide further input.

Yours very truly,

A handwritten signature in cursive script, appearing to read "A C Deans per em".

(Mrs.) Alyson C. Deans, Manager
Corporate Planning and Analysis

ACD:em

cc: MNR, Maple
D. Haley
D. Dyce



the metropolitan toronto and region conservation authority

5 shoreham drive, downsvew, ontario, m3n 1s4 (416) 661-6600 FAX 661-6898

27 March 1991

Mr. P.J. Reynolds
Transportation Planning Section
Central Region
Ministry of Transportation
3rd Floor, Atrium Tower
1201 Wilson Ave.
Downsvew, Ont.
M3M 1J8

Dear Mr. Reynolds:

Re: Hwy. 407 - Route Planning Hwy. 48
to Hwy. 35/115

This will acknowledge and thank you for forwarding copies of "Environmental Technical Paper #1" and the "Inventory and Evaluation of Fisheries Resources for Route Selection". As you are aware, the Authority will also be interested in other aspects of your work related to this project, including, but not limited to, your analysis of the hydraulic/hydrologic implications of the route alternatives.

Generally, the reports provide an excellent summary of the resource issues addressed. I have some specific comments that I hope will assist in finalizing these reports.

Environmental Technical Paper #1

Surface Water Quality; Page 3; paragraph 2 - Reference is made to a Table 2.2 which does not appear in the document.

RECEIVED	
LAVALIN ENGINEER	
APR 11 1991	
Route To:	Int
APR 12 91 L.K.U.	rt
File:	

...../2

Mr. P.J. Reynolds

Page 2

27 March 1991

Re: Hwy. 407 - Route Planning Hwy. 48
to Hwy. 35/115

Fisheries Biology; Page 6; paragraph 2 - These zones were established specific to the Rouge River Watershed and, at this time, have not been determined to apply to all watersheds. Further review and study is required.

Page 8; paragraph 1 - A definition of "potential fish habitat" is required. We assume this is as defined by the Federal Department of Fisheries; however, this should be clarified.

Page 8; paragraph 3 - We are not aware of a dam on the Little Rouge in this vicinity. To our knowledge, there is only one structure in the vicinity of Steeles Avenue.

Page 9; paragraph 1 - A stream "reach" is a section or segment of the watercourse. Your statement would read correctly if written "Bottom substrates in the reaches, or segments of the creek, downstream of pools and upstream of riffles are characterized..."

References: The references provided at the end of each section do not include all of the documents referenced in the text nor the unpublished data and personal communication provided, by Authority staff, as input. We assume that this must also be reflected for other sources of information. We would suggest a more comprehensive reference list would alleviate future concerns and comments regarding the sources and information accessed for your report.

Inventory and Evaluation of Fisheries Resources

Page 22; paragraph 3 - See comments preceding regarding "Fisheries Biology; page 6; paragraph 2 and Page 8; paragraph 1.

Page 42; 6.2.1 - We would be interested in the criteria used in establishing the ranking system referred to in this, and the other sections on "Fisheries Habitat Assessment".

Page 91 - As noted, regarding the Technical Paper, these references seem incomplete and should be expanded to include all sources and contacts.

Mr. P.J. Reynolds

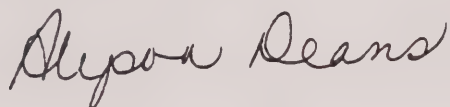
Page 3

27 March 1991

Re: Hwy. 407 - Route Planning Hwy. 48
to Hwy. 35/115

I trust these comments will assist in finalizing these reports and appreciate the opportunity to participate in your work.

Yours very truly,



Alyson C. Deans, Manager
Corporate Planning and Analysis
[extension 269]

ACD:L

cc: Ian Upjohn, Fenco Engineers Inc.,
Kathleen Harding, MOT, Environmental Coordinator
D. Haley, MTRCA
D. Lewis, MTRCA



The Rouge Park Alliance
361A Old Finch Avenue
Scarborough, ON M1B 5K7

Tel: (416) 28-ROUGE
Fax: (416) 287-2425

May 27, 1996

Ontario Ministry of Transportation
Planning Office
3rd Floor, Atrium Tower
1201 Wilson Avenue
Downsview, Ontario
M3M 1J8

Attention: Ms. Denise Marneau
Project Manager

Dear Ms. Marneau:

As per a recent conversation that Gord Weeden had with Paul Jankowski, I wish to inform you that official comments from the Rouge Park Alliance concerning the 407 will come from our partner the Metro Toronto and Region Conservation Authority (MTRCA). MTRCA will provide official comments on behalf of the Rouge Park Alliance with respect to planning matters. The Authority is an active member of the Rouge Park Alliance, the governing body of the Rouge Park. The Alliance is made up of members from the Province, the municipalities of Metro, Scarborough, Markham, Richmond Hill, Whitchurch/Stouffville, Pickering, Metro Zoo and Save the Rouge Valley System Inc. Each partner may be commenting to you directly for their respective organization or municipality but only M.T.R.C.A. will be commenting on behalf of the Rouge Park Alliance.

We look forward to further discussion through M.T.R.C.A. as your proposals proceed.

Sincerely,

Ron M. Christie
Chair
Rouge Park Alliance
RMC/cs

Planning Office
3rd Floor, Atrium Tower
1201 Wilson Avenue
Downsview, Ontario M3M 1J8

Tel: (416) 235-5489

Fax: (416) 235-4940

June 10, 1996

Gord Weeden
General Manager
Rouge Park Alliance
361A Old Finch Avenue
Scarborough, Ontario
M1B 5K7

By Fax
287-2425

Dear Mr. Weeden:

RE: Highway 407/Markham Road Feasibility Study

At the Rouge Park Alliance Board of Directors Meeting on May 15, 1996, the Ministry was requested to provide further information about the process being proposed for the accelerated design and construction of a partial extension of Highway 407 east of Markham Road. Specifically, the Board requested details on how and when the Alliance would be consulted through the design and construction phases.

In response to this request, we have prepared the attached a draft document entitled "Stakeholder Consultation Process, Highway 407, Markham Road Easterly". As we have previously discussed, this draft is provided for the review of the technical representatives of the Alliance prior to discussion with the members of the Board.

Comments about the attached may be forwarded to me by fax at (416) 235-4940.

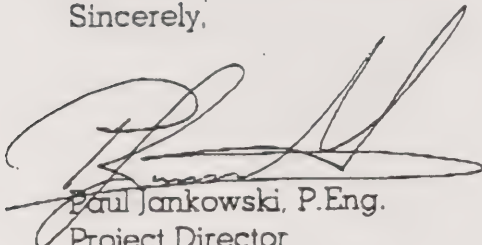
Please note that should you wish to provide a revised version of this document reflecting the comments of the technical reviewers to the Board for their next meeting, we will require at least two working days to consider revisions and/or prepare an update.

Mr. Gord Weeden
Rouge Park Alliance

June 10, 1996
Page 2

Please call me if you have any questions, or if you wish to discuss this issue further.

Sincerely,



Paul Jankowski, P.Eng.
Project Director
Highway 407 East

cc: F. Leech
D. Morneau
P. Reynolds



the metropolitan toronto and region conservation authority

5 shoreham drive, downsview, ontario. m3n 1s4 (416) 661-6600 FAX 661-6898

August 14, 1996

Mr. Paul JanKowski, P.Eng.
Project Director - Highway 407 East
Ministry of Transportation
Planning Office
3rd Floor, Atrium Tower
1201 Wilson Avenue
Downsview, Ontario
M3N 1J8



Dear Paul:

**Re: Draft Stakeholder Consultation Process, Highway 407, Markham Road
Easterly**

A copy of the above report was forwarded to this office by the Rouge Park manager for comment, to assist in the preparation of a recommendation to the Rouge Alliance at their meeting on July 17, 1996.

Staff of the Authority have reviewed the document and have several concerns related to the process outlined as well as with some of the wording within the document. The process outlined appears to be similar to that adopted for the 407 West component. While this process worked relatively well, it did have some shortfalls, specifically related to the formal role of the Authority in the review and approval process. A formal process such as a set of scheduled meetings involving all agencies, similar to that used for a portion of the Western 407 design process would be very effective in maintaining consistency and effective and timely review. Staff of the Authority found the use of scheduled meetings to be very effective on the 407 West and would support and participate in this type of review forum.

The second component of the process which addresses the objectives for addressing environmental and design issues seems premature given the current level of design. This section should be edited to incorporate concerns related to designing watercourse crossings relative to the Authority's Valley And Stream Corridor Management Program, as identified in our letter of September 28, 1995. In addition we have concerns related to the watercourse crossing design section and the criteria for stormwater controls.

In co-ordination with the Rouge Alliance and the Ministry of Natural Resources, we feel it would be beneficial to meet and discuss the specifics related to our comments and concerns with the Consultation Process document.

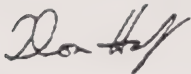
.../2

Working Together for Tomorrow's Greenspace

The above comments reflect only a few of the areas within the document where modifications should be incorporated, specific wording issues and clarification of components of the process will be dealt with during the meeting.

Please contact either myself or Mr. Gord Weeden to set up a meeting to finalize the process.

Yours truly,



Donald R. Haley, P.Eng.
Project Engineer
Resource Science Section
Watershed Management Division

dh/sf

cc: Ron Christie
Gord Weeden
Ken Owen
Dena Lewis
Bernie McIntyre
Mary Asselstine



the metropolitan toronto and region conservation authority
5 shoreham drive, downsvew, ontario. m3n 1s4 (416) 661-6600 FAX 661-6898

December 6, 1996

Ecoplans Limited
2655 North Sheridan Way
Mississauga, Ontario
L5K 2P8

Attention: Mr. Bob Hodgins, B.Sc. (Ag), MBA
Manager, Mississauga Office

DEC - 9 1996

Dear Bob:

Re: Final Draft Stakeholder Consultation Process
Highway 407 - Partial Extension

Staff of The Metropolitan Toronto and Region Conservation have had an opportunity to review the Stakeholder Consultation Process, Final Draft and offer the following comments.

On page 2 of the document, 2nd paragraph, some notation that a schedule for meetings will be developed prior to the design process should be included.

On page 3 of the document, within the Design Alternative Stage, first paragraph, an assessment of existing environmental conditions should also become one of the areas of assessment in the design process. In this regard, the table following page 12 needs to have the Other Environmental Issues at Crossing column expanded to include a number of vegetation and habitat elements as per discussions at our meeting of September 30.

On page 4 under CONSTRUCTION PHASE, a note indicating that the final design drawings will be forwarded to stakeholder groups for comment or information should be added.

As the sections dealing with bridges and culverts have been integrated, it should be renamed **watercourse crossings**. As such, references to bridges and culverts within the bullet points not specific to either type should be updated. Also, the items on page 7 and 8 related to timing restrictions for construction are a duplication.

On page 7, the last bullet point should be revised to remove the **where warranted** clause as site conditions should define the need or lack of need related to maintaining or re-establishing riparian vegetation. **Where warranted** should also be removed from the third bullet point from the bottom of this page.

On page 8, we would expect that groundwater upwelling areas would require an open bottomed culvert, not just where practical.

Under STORMWATER MANAGEMENT, the second bullet point should be revised to reflect a 2 hour 25 mm storm, not 2 Year. The last line under the same bullet point needs to be strengthened. We would prefer a more definite commitment to incorporate alternative storage requirements, not just to give them consideration.

.../2

Under STORMWATER MANAGEMENT, the last bullet point should reflect that the stormwater facility design should incorporate where feasible a mechanism for spills management and containment.

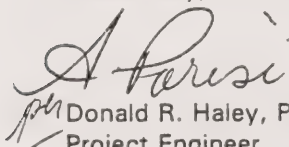
Under the wildlife section on page 10, the second bullet point should be revised to remove the words **significant** and **migratory** as we feel that tree removal should be cognisant of all nesting bird species.

Under the section on Noise, we would suggest that sound mitigation considerations be extended to consider impacts related to non-human communities as well.

In addition, we have a concern related to the implementation of the process. We are concerned that the separation within the E.A. of certain aspects of the design, such as bridge versus culvert decisions will create difficulties in being able to proceed with this extension in a similar fashion as the public/private consortium approach used on the western sections of the highway. We do not wish to get into similar difficulties as arose over designs and costing arguments at the East Don River, where the highway was costed using a culvert option which in fact required a bridge for environmental reasons. While the strategy is designed to accommodate this issue, we have concerns related to how the consortium/OTCC would be implementing this process to avoid such design perception issues as existed at the East Don.

The Authority following our involvement in the process west of highway 48 has concerns related to demands on staff that this compressed design and construction process will undoubtedly have and our role in terms of formal levels of approval. The demand on staff associated with the Western section of the Highway were extensive and resulted in internal workload problems and reduced response times for both the Highway and our day to day work. Given the demands on our staff at present and the obvious need for additional staff time within an even more compressed design and construction schedule, we are concerned that we may not be able to adequately assist in timely review and approval. Given the importance of timing in response on this reach of the Highway and our desire to assist in ensuring that the highway and the watersheds health can both be realized, we feel that our concerns related to staffing need to be discussed and resolved at an early stage in this process.

Yours truly,



Donald R. Haley, P.Eng.

Project Engineer

Resource Science Section

Watershed Management Division

/dh

cc: Brian Denney, MTRCA
Dave Dyce, MTRCA
Dave Ross, MNR
Dena Lewis, MTRCA
Bernie McIntyre, MTRCA
Mary Asselstine, MTRCA



2655 North Sheridan Way
Mississauga, Ontario
L5K 2P8
Phone: (905) 823-4988
Fax: (905) 823-8503

VIA FAX

Dec 10/96

Metro Region Conservation
5 Shoreham Drive
Downsview, Ontario
M1N 1S4

Attn: Mr. Don Haley
Project Engineer

Dear Don:

**RE: HIGHWAY 407 EXTENSION - STAKEHOLDER CONSULTATION
PROCESS**

Thank you for your December 6, 1996 letter providing your final comments on the Stakeholder Consultation Process. Several of the requested changes which you relayed to me by phone have already been made. The following sets out how we propose to deal with your requested changes in the final draft which will be included in the final Environmental Assessment Report.

- The requirement for the development of a schedule has already been included.
- Will add a notation to the Design Alternatives Stage to indicate that existing environmental conditions will be part of the assessment in the design process. Will add a footnote to the Table indicating that Other Environmental Issues can include a broad range of factors including but not limited to vegetation and habitat considerations.
- Have already included a commitment to make final design drawings available to agencies prior to commencement of construction.
- Will change heading from Bridges to Watercourse Crossings. Will modify references to bridges and culverts where the point applies to both situations. Have already removed the duplication of the timing constraint bullet.
- Will remove "where warranted" from the bullets relating to riparian vegetation and wildlife/human passage.
- Will remove "where practical" from the bullet dealing with open bottom culverts in upwelling areas.

- Have already corrected the reference to 2 hour 25 mm storm in the second bullet under stormwater. Changed the wording to "will be considered" and "in consultation with stakeholders" rather than "will give consideration to" in the last sentence of this same bullet.
- Have already modified the bullets dealing with spills to read "Where feasible, opportunities for providing ease of containment of accidental spills will be provided during the design of stormwater management facilities".
- Since the only regulatory requirements relating to nesting periods deal with migratory birds we do not propose to change the second bullet point under wildlife. However, advanced clearing could be a principle developed during the consultation process.
- The noise section implements the MTO/MOEE Noise Protocol. We do not propose to extend this protocol to include non-human communities.

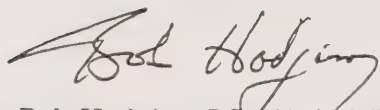
Regarding the two points covered in the last two paragraphs of your letter, we are advised by OTCC that these can be addressed through the contractual arrangement that OTCC makes with the contractor. You should contact OTCC to discuss the specifics of how your concerns can be addressed.

I trust that this satisfactorily addresses your comments and that you will be now be in a position to endorse the Stakeholder Consultation Process. You will have received the Draft Environmental Assessment Report for comment. Since the discussion about the Stakeholder Consultation Process in the Draft EA is based on our telephone conversation of November 14, 1996 it does not include all of the above committed changes. However I assure you that these changes will be reflected in the final EA.

Thank you again for your continued participation in this study.

Yours truly;

ECOPLANS LIMITED



Bob Hodgins, BSc (Ag), MBA
Manager, Mississauga Office

c.c. D. Morneau, P. Reynolds, I. Burkhardt, G. Weeden, D. Ross

APPENDIX 17.3
MUNICIPALITIES

CLERK'S DEPARTMENT



62 Bayview Parkway
Box 147, Newmarket, Ontario L3Y 4W9
Telephone: (416) 895-1231 • 362-2464
887-5188 • 731-0201

October 29, 1991

Mr. R. Lefevre, Coordinator
Ministry of Transportation
Municipal Roads Branch
Cochrane Temiskaming Resource Centre
P.O. 3010
South Porcupine
Timmins, Ontario
P0N 1H0

Dear Mr. Lefevre:

The Council of The Regional Municipality of York, at its meeting held on Thursday, October 24, 1991, adopted, without amendment, the appended Clause No. 9 contained in Report No. 18 of the Regional Engineering Committee, headed "Highway No. 407 - Transportation Corridor".

The Regional Municipality of York, by the adoption of the foregoing clause, endorses the Ministry of Transportation's technically preferred route for Highway 407 from Highway 48 to the York/Durham Line (alignment S1 + S3, south of Locust Hill). Accordingly, Regional Council requests the Ministry of Transportation to schedule the construction of the section of Highway 407 from Highway 48 to the York/Durham Line immediately following the completion of construction of Highway 407 west of Highway 48.

Yours truly,

Doris Sue/mlt
Encl.

cc: Acting Commissioner of Engineering
Sent to: Clerk, Town of Markham

Robert N. Vernon
Regional Clerk



CLERK'S DEPARTMENT
62 BAYVIEW PARKWAY, BOX 147
NEWMARKET, ONTARIO
L3Y 4W9

TEL: (416) 895-1231
(416) 362-2464

FAX: (416) 895-3031

October 26, 1992

I.K. Upjohn, Principal Planner
Environmental Assessment Services
Fenco Engineers Inc.
Atria North - Phase II
2235 Sheppard Avenue East
Willowdale, Ontario
M2J 5A6

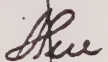
Dear Mr. Upjohn:

The Council of The Regional Municipality of York, at its meeting held on Thursday, October 22, 1992, adopted, without amendment, the appended Clause No. 10 contained in Report No. 18 of the Transportation and Environmental Services Committee, headed "Highway No. 407 Transportation Corridor".

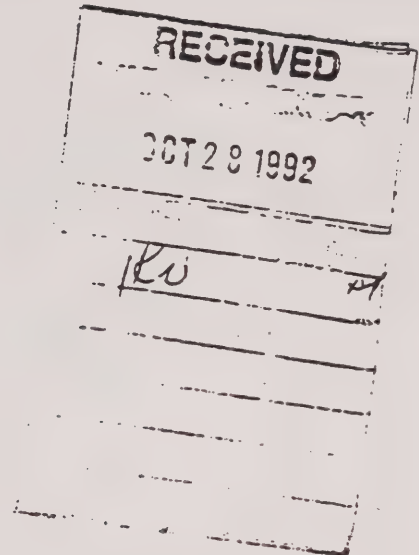
Regional Council, by the adoption of the foregoing clause, endorsed the new alignment for the section of Highway No. 407 between Highway No. 48 and York/Durham Line, known as the S₃ shift alignment.

Yours truly,


Dennis Hearse
Regional Clerk


Doris Sue/mlt
Encl.

Sent to: Clerk, Regional Municipality of Durham
Clerk, Town of Markham
Ministry of Transportation of Ontario
cc: Commissioner of Transportation





OFFICE OF THE REGIONAL CLERK
17250 YONGE STREET, BOX 147
NEWMARKET, ONTARIO
L3Y 6Z1

TEL: (905) 895-1231
(705) 437-1617
(905) 773-3004
(905) 731-0201
FAX: (905) 895-3031

April 15, 1996

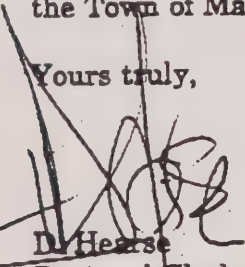
Ms. Denise Morneau
Project Engineer
Planning Office, Central Region
Ministry of Transportation
1201 Wilson Avenue
Downsview, Ontario
M3M 1J8

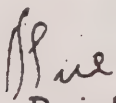


Dear Ms. Morneau:

The Council of The Regional Municipality of York, at its meeting held on Thursday, April 11, 1996, adopted, without amendment, the appended Clause No. 1 contained in Report No. 8 of the Regional Transportation and Works Committee, entitled "Highway No. 407 East/Markham Road, Feasibility Study - Partial Extension", which endorses the process undertaken by the Ministry of Transportation as it relates to the study to address traffic and environmental issues associated with the opening of Highway No. 407 at Markham Road, in the Town of Markham.

Yours truly,


D. Hearse
Regional Clerk


Doris Suepb
A.M.C.T.
Encl.

c. Commissioner of Transportation

Clause No. 1 embodied in Report No. 8 of the Transportation and Works Committee, which was adopted, without amendment, by the Council of The Regional Municipality of York on Thursday, April 11, 1996.

1

HIGHWAY NO. 407 EAST/MARKHAM ROAD FEASIBILITY STUDY - PARTIAL EXTENSION

The Transportation and Works Committee submits for the information of Council the following report, March 19, 1996, from the Commissioner of Transportation and Works, and recommends to Regional Council the endorsement of the process undertaken by the Ministry of Transportation as it relates to the study to address traffic and environmental issues associated with the opening of Highway 407 at Markham Road in the Town of Markham:

Recommendation

It is recommended that this report be received for information.

Background

Construction of the first section of Highway 407 from Highway 410 in Peel Region to Highway 404 is nearing completion and is scheduled to be opened for traffic use in the Fall of this year. The remaining approved sections of Highway 407, from Highway 403 to Highway 410 and from Highway 404 to Highway 48, are scheduled to be opened in 1998.

Since the announcement of the construction of Highway 407, concerns have been raised by the Town of Markham and ratepayer groups with regard to the potential adverse traffic impacts associated with ending the expressway at Highway 48/Markham Road. Concerns relate to the integrity of the Old Markham Village area when Markham Road is used as an access and exit road for Highway 407. In light of these concerns Town of Markham Council on May 10, 1994, and again on June 27, 1995, adopted recommendations from their Works Committee that requested the Ministry of Transportation not proceed with the construction of the northbound exit ramp onto Markham Road at this time. Regional Council on June 9, 1994, endorsed the May 10, 1994, Town of Markham Council resolution.

The extension of Highway 407 from Highway 48 east to Highway 35/115 is currently being planned through an environmental assessment study. However, this study will not be completed in time to allow resolution of these concerns and the potential traffic problems by 1998.

Recognising the legitimacy of these concerns, the Ministry of Transportation initiated a feasibility study to determine possible short term solutions to the potential traffic problems caused by ending Highway 407 at Markham Road. Notice of the initiation of the "Highway 407 East Partial Extension Feasibility Study" was received by Transportation and Works Committee on January 31, 1996. The feasibility study will examine:

- traffic problems and opportunities;
- Federal and Provincial environmental assessment and approval requirements;
- freeway cost/revenue status; and
- associated improvements to the existing road network.

Clause No. 1
Report No. 8
Transportation and
Works Committee

The study will examine and make recommendations on where the interim terminus should be for Highway 407 east of Highway 48.

The consulting firms of McCormick Rankin Consulting Engineers and Totten Sims Hubicki Associates have been retained by the Ministry to undertake this study.

A consultant presentation on the progress of the study will be made to the Transportation and Works Committee on April 3, 1996.



OFFICE OF THE REGIONAL CLERK
17250 YONGE STREET, BOX 147
NEWMARKET, ONTARIO
L3Y 6Z1

TEL: (905) 895-1231
(705) 437-1617
(905) 773-3004
(905) 731-0201
FAX: (905) 895-3031

November 18, 1996

COPY

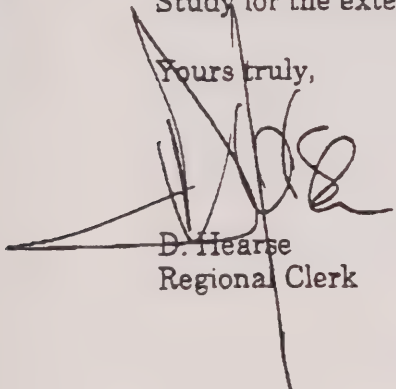
Mr. Ravi Girdhar, Director
Transportation Systems, Planning Branch
3rd Floor, West Tower
1201 Wilson Avenue
Downsview, Ontario, M3M 1J8

Dear Mr. Girdhar:

The Council of The Regional Municipality of York, at its meeting held on Thursday, November 14, 1996, adopted, without amendment, the appended Clause No. 3 contained in Report No. 21 of the Transportation and Works Committee, entitled "Environmental Assessment Study, Partial Extension - Highway No. 407 East".

Accordingly, by the adoption of the foregoing clause, Regional Council advises it supports the Highway 407 East Partial Extension Feasibility study, and the process the Ministry is undertaking in examining the feasibility of fast-tracking the Environmental Assessment Study for the extension of Highway 407, east of Markham Road.

Yours truly,



D. Hearse
Regional Clerk

Doris Sue:bb
Encl.

c. Commissioner of Transportation and Works
Paul Jankowski, Ministry of Transportation
E. King

Sent to: Ministry of Environment and Energy
M.P.P., York Mackenzie
M.P.P., Durham-York
M.P.P., York Centre
M.P.P., Markham
Clerk, Town of Markham





G. F. Roseblade, C.M.O., C.M.C.
Town Clerk
Christine Palmer, A.M.C.T.
Deputy Clerk

April 17th, 1990

Mr. I. K. Upjohn, M.C.I.P.
Principal Planner
Environmental Services
Transportation
Fenco Engineering Inc.
Atria North - Phase II
2235 Sheppard Avenue East
Willowdale, Ontario
M2J 5A6

I. Upjohn

Dear Mr. Upjohn:

Re: HIGHWAY 407 FROM
HIGHWAY 48 TO WHITBY/OSHAWA BOUNDARY
ROUTE PLANNING AND ENVIRONMENTAL
ASSESSMENT STUDY ROUTE ALTERNATIVES
AND ANALYSIS AND EVALUATION FACTORS
OUR FILE NO. 62-0

Further to our conversation with respect to the subject matter, enclosed is a copy of an extract passed by Council of the Corporation of the Town of Markham at its meeting held on April 10th, 1990.

Yours very truly,

Christine Palmer
Deputy Clerk

CP/lh
Encl.

THE CORPORATION OF THE TOWN OF MARKHAM

To: Director of Engineering

EXTRACT FROM THE SEVENTH COUNCIL MINUTES OF THE CORPORATION OF THE TOWN OF MARKHAM IN THE YEAR 1990 HELD ON APRIL 10, 1990

331. FENCO ENGINEERS INC. - HIGHWAY 407 FROM
HIGHWAY 48 TO WHITBY/OSHAWA BOUNDARY
ROUTE PLANNING AND ENVIRONMENTAL
ASSESSMENT STUDY ROUTE ALTERNATIVES
AND ANALYSIS AND EVALUATION FACTORS (62-0)

Mr. D. Garner from the Ministry of Transportation of Ontario was in attendance and presented Members of Council with a brochure entitled "Highway 407 Route Planning and Environmental Assessment Study - Highway 48 to Highway 35/115. Mr. Garner advised that the Ministry of Transportation has initiated a study to determine the location and right-of-way requirements for proposed Highway 407 from Highway 48 in Markham easterly to Highway 35/115 in the Town of Newcastle. Fenco Engineers Inc. are the consultants for that portion from Highway 48 east to Whitby/Oshawa Boundary.

Mr. Patrick Reynolds, Ministry of Transportation advised that in the next two months a series of meetings will be held with the municipalities in order to bring them up-to-date. Following these meetings, public information centres will be set up in the month of May and the meeting for Markham has been scheduled at the Markham Community centre on the 15th of May, 1990 between the hours of 3:00 p.m. to 9:00 p.m.

Mr. Ian Upjohn and Mr. Ati Minchev were also in attendance from Fenco Engineers Inc. and presented Council with maps showing the alternative routes for proposed Highway 407. The purpose of the Route Planning Study is to determine and obtain approvals for an ultimate 10 lane freeway from Highway 48 to the vicinity of Durham Road 34 and an interregional transit right-of-way from Highway 48 to the vicinity of Durham Road 34.

It was

Moved by Councillor D. Tsubouchi
Seconded by Councillor A. Chiu

RESOLVED THAT the presentation by the Highway 407 Project Team, Fenco Engineers Inc., with respect to alternative freeway/transit routes currently under consideration in the western section of the study area in connection with Highway 407 from Highway 48 to the Whitby/Oshawa boundary together with plans showing the route alternatives for the eastern

THE CORPORATION OF THE TOWN OF MARKHAM

section of the study area (Whitby/Oshawa boundary to Highways 35 and 115), be received.

Resolution Carried.

Christine Palmer

MARKHAM

Dalibor Keliar, P. Eng.
Commissioner of Works

April 5, 1991

Ministry of Transportation
Central Region
Transportation Planning Section
3rd Floor, Atrium Tower
1201 Wilson Avenue
Downsview, Ontario
M3M 1J8

Attention: Mr. D. Garner
Head Transportation Planning Office

Dear Sir:

Re: Highway 407 Route Planning Study
Highway 48 to the Whitby/Oshawa Boundary
W.P. 282-86-01



Further to our January 8th, 1991 meeting we are in receipt of your January 16th, 1991 letter regarding the Highway 407 interchange at the Markham By-Pass and 10th Line.

I wish to confirm that given the option of having an interchange at either the Markham By-pass or 10th Line, we would have to agree that an interchange at the By-pass is preferable. The By-pass is anticipated to convey a considerably greater volume of traffic when it is completed and connected into an arterial road in Scarborough then the 10th Line would.

In addition the By-pass interchange with Highway 407 will help address the shortfall of capacity anticipated to occur in this area by the Northeast Metro Strategic Transportation Committee.

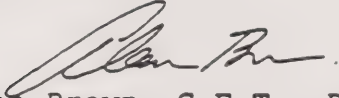
We would however, request the Ministry and your consultant protect in the design of Highway 407 options so that an interchange at 10th Line (Full or partial) would be technically feasible to construct in the future if ever warranted. The 10th Line interchange could be similar to the proposed Leslie Street/Highway 407 interchange.



We are in receipt of your consultants March 20, 1991 submission regarding this matter which we will review and respond to.

I would be pleased to review this option with you or your staff at your earliest convenience.

Yours truly,

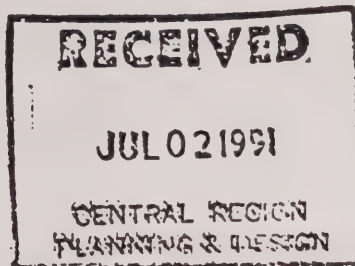


Alan Brown, C.E.T., Director
Engineering Department

cc: J. Ireland - Region of York

8295k-80/81
AB*hh

June 19, 1991



MINISTRY OF TRANSPORTATION
Planning & Design Section
Central Region
5th Floor, Atrium Tower
1201 Wilson Avenue
Downsview, Ontario
M3M 1J8

Attention: Mr. R.S. Hanmer, M.B.A., P.Eng.
Area Manager

RE: Highway 407 - Highway 48 East to
York/Durham Line

Dear Sir:

Subsequent to your June 11, 1991 presentation to our Council, we have reviewed the Ministry of Transportation's (MTO) preferred route alignment for Highway 407 east of Highway 48 and have no objections in principle subject to resolution of the following matters:

Heritage Houses

It appears that two Heritage houses (Prentice House, 1860, and Seaver House, 1843) are within the Highway 407 right-of-way. Suitable arrangements for their relocation to the satisfaction of Heritage Markham and Town Council are required by the MTO.

Environmental

The MTO is to implement storm water quantity and quality guidelines as required by the M.T.R.C.A., MNR and this department.

Noise Attenuation

Noise attenuation measures to protect the existing Markham residents who will abut Highway 407 are required if the noise levels are over the MOE criteria.

. . . /2

Woodlot

In order to provide an interchange at the Markham By-Pass and preserve the woodlot south of Highway 7 west of the Markham By-Pass, the MTO has proposed to slightly realigned Markham By-Pass north of Highway 7. Although the realignment will impact the woodlot north of Highway 7, it appears to be the preferred option that will minimize the overall impact on the two woodlots. The costs associated with modifying the existing portion of Markham By-Pass north of Highway 7 should be incorporated into the Ministry's capital costs for Highway 407.

Markham by-pass/Highway 407 interchange

In accordance with our enclosed April, 1991 letter to the Ministry, the 10th Line interchange has been relocated to the Markham By-Pass. We would again request the Ministry protect in their design for Highway 407 options for an interchange at 10th Line (full or partial) so that it can be constructed if ever warranted in the future. Given the Federal and provincial interests in this area (airport, Seaton Community), we do not recommend deleting the option of at least a partial interchange, if it is technically feasible. The proposed treatment would be typical of the Leslie Street partial interchange with Highway 407 which is in close proximity to Highway 404.

The Ministry of Transportation should confirm that all costs associated with the By-Pass/Highway 407 interchange will be incorporated under the work program.

Transitway Corridor

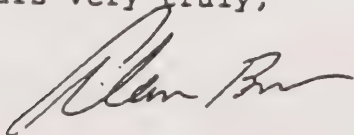
We would also request the Ministry of Transportation to initiate a study for the transit corridor adjacent to Highway 407 in co-operation with the Region of York and affected municipalities to determine the long term transit requirements for this area.

New Highway 7

We would also request the Ministry of Transportation to initiate a study for the realignment of Highway 7 east of Ninth Line.

I look forward to working with the Ministry on this project and if you have any questions, please do not hesitate to contact me.

Yours very truly,



I.A. Brown, C.E.T.,
Director -
Engineering Department

JF/bel
WPPENG/34/24-25

cc: D. Keliar, Commissioner of Works



G.F. Roseblade, C.M.O., C.M.C.
Town Clerk

Christine Palmer, A.M.C.T.
Deputy Clerk

December 12, 1991



Mr. Patrick Reynolds
Project Manager
Ministry of Transportation
3rd Floor, Atrium Tower
1201 Wilson Avenue
Toronto, Ontario
M3M 1J8

Dear Sir:

Re: HIGHWAY 407 TRANSPORTATION CORRIDOR
ROUTE PLANNING AND ENVIRONMENTAL
ASSESSMENT STUDY - HIGHWAY 48 TO THE
EAST TOWN LINE
Our File 62-0)

The Council of the Town of Markham, at its meeting held on November 26th, 1991, had before it for consideration a joint report from the Commissioner of Works and the Commissioner of Planning and Development with respect to the subject matter and passed the following resolution:

"RESOLVED THAT the joint report dated November 26th, 1991 from the Commissioner of Works and Commissioner of Planning and Development entitled "Highway 407 Transportation Corridor Route Planning and Environmental Assessment Study Highway 48 to the East Town Limit", be received;

AND THAT the preferred technical alignment (S1-S3) for Highway 407 within Markham between Highway 48 and the York-Durham Line be endorsed, subject to the provisions outlined in the aforementioned report attached hereto as Appendix 'A';

AND FURTHER THAT the Ministry of Transportation, the Region of York, the Region of Durham and the Town of Pickering be advised of the Town's position."

...2

Mr. Patrick Reynolds

Page Two

I have enclosed for your information a copy of the report from the Commissioner of Works and the Commissioner of Planning and Development.

Yours very truly,



Janice Harrison
Council/Committee Co-Ordinator

JH/jik

Encl.

c.c. Commissioner of Planning and Development
Commissioner of Works

1464/29



Alan Brown Director
Engineering Department

March 30, 1992

Ministry of Transportation
Engineering and Right-Of-Way Office
Atrium Tower, 3rd Floor
1201 Wilson Avenue
Downsview, Ontario
M3M 1J8



Attn: Mr. P. Reynolds
Project Manager

Dear Sir:

Re: Highway 407/Transit Transportation Corridor
Route Planning Studies
(Highway 48 to Highway 35/115)

We are in receipt of a letter from Mr. D. Garner, Manager, dated January 16, 1992, in which the Ministry addressed the provisions outlined in the joint report from the Commissioners of the Works Department and the Planning and Development Department.

With regard to Provisions 1 and 2, we would like to stress the need by the Town of Markham to have Highway 407 terminate at the Markham By-Pass, rather than the present terminus at Highway 48. The Region of York concurs with the Town and has recommended that construction of the section of Highway 407, between Highway 48 and the York/Durham Line be commenced immediately upon completion of construction of the section of the Highway west of Highway 48.

The termination of Highway 407 at Highway 48 would adversely impact residents of Markham by subjecting them to significant loading of the local roads.

.../2



- 2 -

We would appreciate if the Ministry takes all possible efforts to terminate Highway 407 at the Markham By-Pass in the construction stage east of Woodbine Avenue.

With regard to Provision 3, it is our view that the Highway 7 Relocation Study should commence as soon as possible following confirmation of a Route for Highway 407, and should, therefore, be supported by an early funding commitment.

Yours truly,



Alan Brown
Director,
Engineering Department

C.C. L. McCool - Planning Department
J. Mark - Region of York

AA/dm
GEN1185-1/2



LEGAL SERVICES COMMISSION
Clerk's Department

October 14th, 1992



Mr. Patrick Reynolds
Project Manager
Ministry of Transportation
Central Region
Transportation Planning Section
3rd Floor, Atrium Tower
1201 Wilson Avenue
Downsview, Ontario
M3M 1J8

Dear Sir:

RE: UPDATE ON: HIGHWAY 407 TRANSPORTATION
CORRIDOR ROUTE PLANNING AND ENVIRONMENTAL
ASSESSMENT STUDY - HIGHWAY 48 TO THE
EAST TOWN LIMIT
OUR FILE NO. 62-0

This will advise that the Council of the Town of Markham, at its meeting held on October 13th, 1992 passed the following resolution with respect to the subject matter:

"UPDATE ON: HIGHWAY 407 TRANSPORTATION
CORRIDOR ROUTE PLANNING AND ENVIRONMENTAL
ASSESSMENT STUDY - HIGHWAY 48 TO THE
EAST TOWN LIMIT (62-0)

(October 13th, 1992) Commissioner of Works and
Commissioner of Planning and Development forwarding
an update on the Highway 407 transportation corridor
route planning and environmental assessment study for
that portion of the proposed Highway 407 from Highway
48 to the east Town limit.

RECOMMENDED: RECEIVE AND THAT THE MODIFIED
ALIGNMENT (S1-S3 SHIFT) OF HIGHWAY
407 BE ENDORSED;

....2/

Page 2
Mr. Patrick Reynolds

AND THAT THE PROVISIONS OUTLINED IN THE WORKS COMMISSION/PLANNING AND DEVELOPMENT COMMISSION JOINT REPORT ENTITLED "HIGHWAY 407 TRANSPORTATION CORRIDOR ROUTE PLANNING AND ENVIRONMENTAL ASSESSMENT STUDY - HIGHWAY 48 TO THE EAST TOWN LIMIT" DATED NOVEMBER 26TH, 1991, BE A CONDITION OF THIS ENDORSEMENT;

AND FURTHER THAT THE MINISTRY OF TRANSPORTATION, REGION OF YORK, REGION OF DURHAM, TOWN OF PICKERING AND ENVIRONMENT MARKHAM BE SO ADVISED."

Enclosed for your use is a copy of a joint report dated October 13th, 1992 from the Planning and Development Department and Works Department respecting the above matter.

Yours truly,


Janice Harrison, A.M.C.T.
Council & Committee Co-Ordinator

JH/lh
Encl.

c.c. Mr. Dennis Hearse, Regional Clerk
The Regional Municipality of York
62 Bayview Avenue
Box 147
Newmarket, Ontario
L3Y 4W9

Mr. Cecil Lundy, Regional Clerk
The Regional Municipality of Durham
Box 623
605 Rossland Road East
Whitby, Ontario
L1N 6A3

Mr. Bruce Taylor, Town Clerk
The Corporation of the Town of Pickering
One The Esplanade
Pickering, Ontario
L1V 6K7

Mr. Colin Creasy, Chairman
9 Webber Crescent
Unionville, Ontario
L3R 2L3

THE CORPORATION OF THE TOWN OF MARKHAM

DATE: October 9, 1996

EXTRACT FROM THE MINUTES OF THE COUNCIL MEETING HELD ON
OCTOBER 8, 1996

COUNCIL
MINUTE #

ENGINEERING REC'D.

OCT 23 1996

493. MINISTRY OF TRANSPORTATION - HIGHWAY
407 PARTIAL EXTENSION - RESOLUTION
RESPECTING INTERIM TERMINATION OF
HIGHWAY 407 AT HIGHWAY 48 (5.10 & 13.2.7)

It was

Moved by Councillor R. Barber
Seconded by Councillor R. Maheu

RESOLVED THAT the letter dated September 30, 1996 from the Ministry of Transportation with respect to Highway 407 partial extension, be received;

AND WHEREAS the Ministry of Transportation in its September 30, 1996 letter advised of its intention to continue with the construction of Highway 407 east of Highway 48 in an expeditious manner, and that the interim termination of Highway 407 at Highway 48 would have access to and from the north and south;

THEREFORE BE IT RESOLVED THAT the Town of Markham has supported and requested the extension of Highway 407 to at least the Markham By-pass at the earliest opportunity;

AND THAT the Ministry of Transportation be requested to take all necessary steps to expedite the extension of Highway 407 east of Highway 48;

AND THAT the Ministry of Transportation work with the Town of Markham to mitigate the impact of the interim termination of Highway 407 at Highway 48 (Main Street) which includes Main Street traffic calming, heavy truck restrictions on Main Street, Highway 7 turning improvements etc.;

- 2 -

AND THAT the Ministry of Transportation be requested to continue to work with the Town in addressing measures to mitigate the impact of terminating Highway 407 at Highway 48 (Main Street);

AND THAT the Director of Engineering be authorized to retain Entra Consultants Ltd. to prepare a traffic calming plan on Main street and adjacent local north/south streets (i.e. Albert Street, George Street, etc.) at an upset limit of \$15,000 to be temporarily financed from capital account #53-5399-745 traffic calming plan;

AND THAT a steering group consisting of Regional Councillor Gord Landon, Ward V Councillor Ralph Aselin, Ward IV Councillor George McKelvey, Community Services representative, Development Services Commission representative, local ratepayer representatives and Entra Consultants be established and authorized to finalize the mitigative measures for Main Street;

AND THAT the steering group report back to Council with the final recommendations;

AND FURTHER THAT Mr. Kevin Pask, Regional Director of Planning and Construction for the Ministry of Transportation, Dave Garner, Executive Vice President-Engineering of Ontario Transportation Capital Corporation and Kees Schipper, Commissioner of Transportation and Works for the Region of York, be advised accordingly.

Resolution Carried.

ACTION DEPARTMENT: Director of Engineering
INFORMATION DEPARTMENT: Commissioner of Development Services
OTHER: Treasurer/Director of Financial Services



December 14, 1990

The Regional
Municipality
of Durham

Clerks Department

605 Rossland Road East
P.O. Box 623,
Whitby, Ontario
Canada, L1N 6A3
(416) 668-7711
Fax: (416) 668-9963

C.W. LUNDY, A.M.C.T.
Regional Clerk

Mr. C. Lumley
Area Manager
Transportation Planning Office
Ministry of Transportation
3rd Floor, Atrium Tower
1201 Wilson Avenue
Downsview, Ontario
M3M 1J8

Highway 407 Route Planning Preliminary Design,
Environmental Assessment Study, Highway 48 to
Highway 35/115

Mr. Lumley, the Planning and Works Committees of
Regional Council considered the above matter and at a
meeting held on December 12, 1990 Council adopted the
following recommendations of the Committees:

- "a) THAT the alignment of Highway 407 as shown on
Attachment 'A' to Commissioners' Report
#90-238P and #224-90W be endorsed as the Region's
preferred alternative at this time, in particular
as it relates to that portion between Coronation
Road in the Town of Whitby and Oshawa-Newcastle
boundary;
- b) That S-5, SC-2, C-3, C-4 and CS-1 be considered as
the alternative route in the westerly portion of
the Region; and
- c) THAT a copy of Commissioners' Report #90-238P and
#224-90W be forwarded to Mr. C. Lumley of the
Ministry of Transportation and to the area
municipalities in the Region."

.../2



Enclosed for your consideration is a copy of the Joint Staff Report.



C.W. Lundy, A.M.C.T.
Regional Clerk

CWL:ak

Encl.

cc: Mr. A.T. Hodges, Clerk
Town of Ajax
Mr. G.S. Graham, Clerk-Administrator
Township of Brock
Ms. P.L. Barrie, Clerk
Town of Newcastle
Mr. R.A. Henderson, Clerk
City of Oshawa
Mr. B. Taylor, Clerk
Town of Pickering
Mr. E.S. Cuddie, Clerk-Administrator
Township of Scugog
Mr. W.E. Taylor, Clerk
Township of Uxbridge
Mr. D.G. McKay, Clerk
Town of Whitby
Dr. M.R. Michael, Commissioner of Planning
Mr. W.A. Twelvetrees, Commissioner of Works



March 5, 1996

Mr. F. Leech
Manager
Planning Office and Environmental Section
Ministry of Transportation
3rd Floor, Atrium Tower
1201 Wilson Avenue
Downsview, Ontario
M3M 1J8

The Regional
Municipality
of Durham
Clerk's Department

605 Rossland Rd. East
P.O. Box 623
Whitby, Ontario
Canada L1N 6A3
(905) 668-7711
Fax: (905) 668-9963


C. W. Lundy A.M.C.T.
Regional Clerk

Highway 407 East Partial Extension Feasibility Study. Our File: T04-3

Mr. Leech, the Planning Committee of Regional Council considered your letter dated January 18, 1996 with respect to the above matter and at a meeting held on February 28, 1996, Council adopted the following recommendations of the Committee:

- "a) THAT the Region of Durham encourages the continued extension of Highway 407 beyond its planned terminus at Markham Road in 1998;
- b) THAT the Region of Durham reaffirms its support for the extension of Highway 407 easterly to Highway 401 in the vicinity of Courtice Road (Regional Road 34) at the earliest opportunity; and
- c) THAT a copy of Commissioner's Report #96-P-21 be circulated to the Area Municipalities in Durham, the Town of Markham, the Regional Municipality of York, Durham Region M.P.P.s, and the Minister of Transportation."

Enclosed for your consideration is a copy of Report #96-P-21 of Mr. A. Georgieff, Commissioner of Planning.


C.W. Lundy, A.M.C.T.
Regional Clerk

cc: The Honourable A. Paladini, Minister of Transportation
Ms. J. Munro, M.P.P. (Durham-York)
Mr. J. O'Toole, M.P.P. (Durham East)
Ms. J. Ecker, M.P.P. (Durham-West)
Mr. G. Ouellette, M.P.P. (Oshawa)



Regional Municipality of Durham

Mr. J. Flaherty, M.P.P. (Durham Centre)
Mr. D. Hearse, Clerk, Regional Municipality of York
Mr. B. Panizza, Clerk, Town of Markham
Mr. J. Tiernay, Clerk, Town of Ajax
Mr. G. Graham, Clerk, Township of Brock
Ms. P. Barrie, Clerk, Municipality of Clarington
Mr. B. Suter, Deputy Clerk, City of Oshawa
Mr. B. Taylor, Clerk, Town of Pickering
Mr. E. Cuddie, Clerk, Township of Scugog
Mr. W. Taylor, Clerk, Township of Uxbridge
Mr. D. McKay, Clerk, Town of Whitby
Mr. A. Georgieff, Commissioner of Planning



Planning Department
Commissioner's Report to Planning Committee
Report No. 96-P- 21
Date: February 20, 1996

SUBJECT

Highway 407 East Partial Extension Feasibility Study, File: 4.4.18.6

Correspondence No. 96-50 dated January 18, 1996 from Mr. F. Leech, Manager,
Planning Office and Environmental Section, Ministry of Transportation

RECOMMENDATIONS

1. THAT the Region of Durham encourages the continued extension of Highway 407 beyond its planned terminus at Markham Road in 1998;
 2. THAT the Region of Durham reaffirms its support for the extension of Highway 407 easterly to Highway 401 in the vicinity of Courtice Road (Regional Road 34) at the earliest opportunity; and
 3. THAT copies of Commissioner's Report No. 96-P- 21 be circulated to the Area Municipalities in Durham, the Town of Markham, the Regional Municipality of York, Durham Region M.P.P.s, and the Minister of Transportation.
-

REPORT

1. Purpose of this Report

- 1.1 The Ministry of Transportation (MTO) recently initiated a study to investigate solutions to potential impacts associated with the planned opening of Highway 407 to Markham Road (Highway 48) in 1998. This report introduces the Highway 407 East Partial Extension Feasibility Study (the Study) and:
 - outlines the Study purpose and objectives;
 - considers the implications of potential alternative strategies; and
 - discusses future directions.

2. Study Purpose and Objectives

- 2.1 Highway 407 will ultimately link Highway 35/115 in Clarington to the Queen Elizabeth Way in Burlington. The Province, through the Ontario Transportation Capital Corporation, is presently constructing the portion of Highway 407 from Markham Road to Highway 403 as a toll facility. The first stage, from Highway 404 to Highway 410, is scheduled to open in 1996. The remaining portions, from Highway 410 to Highway 403 and Highway 404 to Markham Road, are expected to be completed by 1998.
- 2.2 Concerns have been raised about the traffic and environmental implications of terminating the freeway at Markham Road. With limited opportunities to improve Markham Road and adjacent arterial roads, increased congestion in this area is expected. Recognizing that there is inadequate time to complete planning and environmental assessment studies required for the entire easterly extension to Highway 35/115, the Province has initiated the Study to provide a strategy for addressing these concerns.
- 2.3 In developing this strategy, the Study will examine:
- transportation and environmental implications and opportunities;
 - alternatives solutions, including improvements to the existing road network, partial extensions of Highway 407 and the complete extension;
 - federal and provincial environmental assessment and approval requirements; and
 - freeway cost/revenue considerations.
- 2.4 The Study also provides for consultation with area and regional municipal transportation staff. The Regional Planning and Works Departments will be participating.

3. Implications of Alternative Strategies

- 3.1 Joint Report No. 95-J-1 articulated the importance of completing Highway 407 through Durham Region. The previous report illustrated the immense economic and social benefits of this important transportation facility, to the

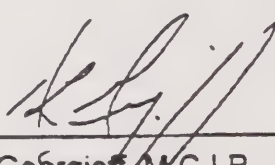
Region and the GTA. It also highlighted important urban structure and development opportunities. Expediting its construction would be extremely beneficial to Durham.

3.2 The implications of the most likely alternative strategies were considered. The following issues were noted:

- Terminating Highway 407 at or to the west of Markham Road should not be encouraged. If this strategy is pursued, the freeway would not be of significant benefit to Durham and likely delay its ultimate extension into the Region;
- Strategies which advocate improvements to the existing arterial road and Provincial highway system could pose adverse impacts on several hamlets in Durham and York Regions and should be considered carefully. Providing additional road capacity on existing routes which travel through or adjacent to communities such as Whitevale, Cherrywood and Green River, could have detrimental implications;
- If fiscal or environmental conditions necessitate, or time limits dictate, MTO may consider partial extensions of Highway 407. It is imperative that the Study carefully evaluate potential impacts to existing roadways and communities, and linkage opportunities with existing transportation facilities. If the proposed strategy does not adversely affect the Region, an interim solution should be supported. However, the Region should be sure to emphasize that it considers the solution to be temporary; and
- As articulated in Joint Report No. 95-J-1, the extension of Highway 407 to Highway 401 in the vicinity of Courtice Road (Regional Road 34) should continue to be the Region's position. Given the evident benefits the facility would provide, the Region should reaffirm its support for the extension through Oshawa.

4. Future Directions

- 4.1 The Regional Planning and Works Departments will continue liaising with MTO and the Study consultants McCormick Rankin and Totten Sims Hubicki to articulate Durham's position and concerns on any proposed strategies. Planning Committee will be apprised of future progress.
- 4.2 This report should be circulated to the parties noted above to advise them of the Region's comments.
5. The Regional Works Department has reviewed this report.



A.L. Georgi, M.C.I.P., R.P.P.
Commissioner of Planning

Attachment No. 1: Correspondence No. 96-50 dated January 18, 1996 from
Mr. F. Leech, MTO

RECOMMENDED FOR PRESENTATION TO COMMITTEE



G.H. Cobitt, M.S.W., C.A.O.

I:\WP44\CR407PAR.GC

Ministry of
Transportation

Ministry of
Transportation
JAN 22 Des 9 33 AM '96

Tel: (416) 235-5545
Fax: (416) 235-4940

January 18, 1996

Mr. Viktor A. Silgailis, Commissioner of Works
Regional Municipality of Durham
Box 623
605 Rossland Road East
Whitby, Ontario *SCUB*
LIN 6A3

CLERKS DEPARTMENT

Original To:	<i>lwt</i>
Copy To:	<i>A. Z. Silgailis</i>
Name and File	
Discuss With	
Present Address	
Note & Return To	
Investigate & Report	
Take Appropriate Action	
Time Application	
Priority Review For the	
Operation	

JAN 23 1996

86381
OF
PLANNING

Dear Mr. Silgailis:

RE: MTO Strategy to Address Concerns Relative to the Opening of Highway 407 at Highway 48 in 1998.

Concerns have been raised relative to the potential traffic impacts associated with the planned 1998 opening of Highway 407 to Markham Road (Highway 48). The planning and environmental assessment work underway on the section of Highway 407 from Markham Road easterly to Highway 35/115 will not be completed in time to adequately deal with these concerns by 1998.

Highway 407 from Highway 403 in the City of Mississauga to Highway 48 (Markham Road) in the Town of Markham is presently under construction by the Ontario Transportation Capital Corporation. The first stage of Highway 407, from Highway 410 to Highway 404, is scheduled to be opened in 1996. The balance of the approved portion of Highway 407, from Highway 403 to Markham Road, is scheduled to be open in 1998.

MTO has agreed to undertake a feasibility study to investigate solutions to address potential traffic problems that will result from the opening of Highway 407 to Markham Road by 1998. The feasibility study is to examine:

- traffic problems and opportunities;
- federal and provincial environmental assessment and approval requirements;
- freeway cost/revenue status; and
- associated improvements to the existing road network.

This feasibility study is now underway. The Ministry has retained the services of McCormick Rankin Consulting Engineers and Totten Sims Hubicki Associates to undertake this study.

The timeline for completion of the feasibility study and the recommendation of an implementation strategy is March 31, 1996. The recommendations resulting from the feasibility study will be considered for early implementation and will be recognized in the preliminary design and environmental assessment study for the balance of the Highway 407 extension to Highway 35/115 and the two Highway 407/401 Links.

The Ministry welcomes and encourages the active participation of the affected municipalities in the Highway 407 East Partial Extension Feasibility Study. Mr. John Sutherns of McCormick Rankin Consulting Engineers will be contacting you in the near future to identify your appropriate technical representation for input to the study.

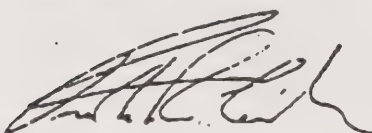
Thank you in advance for your input to this study. In the meantime, if you have any questions, please contact one of the following:

Mr. Paul Jankowski, Project Director (416) 235-5482
Highway 407 East Studies, MTO

Ms. Denise Morneau, Project Manager (416) 235-5489
Highway 407 East Partial Extension
Feasibility Study, MTO

Mr. John Sutherns, Project Manager (905) 823-8500
McCormick Rankin and Associates Ltd.

Sincerely,



Fred Leech
Manager, Planning Office and Environmental Section

FLDM

cc: Cecil W. Lundy, Clerk, Regional Municipality of Durham
D. Garner, Ontario Transportation Capital Corporation
K. Pask, Regional Director, Planning, Engineering & Construction, MTO
P. Reynolds, Environmental Section, MTO
J. Sutherns, McCormick Rankin Consulting Engineers
D. Allingham, Totten Sims Hubicki Associates



November 7, 1991

The Regional
Municipality
of Durham

Clerks Department

605 Rossland Road East
P.O. Box 823,
Whitby, Ontario
Canada, L1N 6A3
(416) 668-7711
Fax (416) 668-9963

C.W. LUNDY, A.M.C.T.
Regional Clerk

Mr. Patrick Reynolds
Senior Transportation Planner
Transportation Planning Department
Ontario Ministry of Transportation
1201 Wilson Avenue, 3rd Floor
Atrium Tower
Toronto, Ontario
M3M 1J8

Technically Preferred Alignment for the Hwy.
407/Transportation Corridor in the Region of Durham
File No.: T05

Mr. Reynolds, the Planning and Works Committees of Regional Council considered the above matter and at a meeting held on October 30, 1991 Council adopted the following recommendations of the Committee:

- "a) THAT the technically preferred route for the proposed Highway 407/Transit Transportation Corridor in the Region of Durham be endorsed; and
- b) THAT the Ministry of Transportation be requested to consider the issues identified in Joint Report #91-J-31 of the Commissioner of Planning and the Commissioner of Works during subsequent refinements to the alignment of the technically preferred route."

I have enclosed a copy of Joint Report #91-J-31 of the Commissioner of Planning and the Commissioner of Works for your consideration and reply.

C.W. Lundy, A.M.C.T.
Regional Clerk

CWL:sv
Encl.

cc: Mr. A.T. Hodges, Clerk, Town of Ajax
Mrs. P.L. Barrie, Clerk, Town of Newcastle
Mr. R.A. Henderson, Clerk, City of Oshawa
Mr. B. Taylor, Clerk, Town of Pickering
Mr. D.G. McKay, Clerk, Town of Whitby
Dr. M. Michael, Commissioner of Planning
Mr. V.A. Silgailis, Commissioner of Works



This paper contains recycled material.

The Regional Municipality of Durham

Joint Report of the Commissioners of Planning and Works
to the Planning Committee and Works Committee

Report No. 91-J-31

Date: October 22, 1991

SUBJECT

TECHNICALLY PREFERRED ALIGNMENT FOR THE HIGHWAY 407/TRANSIT
TRANSPORTATION CORRIDOR IN THE REGION OF DURHAM, FILE: 4.4.18

CORRESPONDENCE #91-52 DATED JANUARY 29, 1991 FROM T.W. GOODCHILD,
DIRECTOR, PLANNING & DEVELOPMENT, CITY OF OSHAWA

CORRESPONDENCE #91-502 DATED SEPTEMBER 10, 1991 FROM C.R. LUMLEY,
AREA MANAGER, MINISTRY OF TRANSPORTATION

CORRESPONDENCE #91-505 DATED SEPTEMBER 10, 1991 FROM I.K. UPJOHN,
PRINCIPAL PLANNER, ENVIRONMENTAL SERVICES TRANSPORTATION, FENCO
ENGINEERS, INC.

CORRESPONDENCE #91-506 DATED SEPTEMBER 10, 199 FROM D.W. COUTTS,
PROJECT MANAGER, PARKER CONSULTANTS

CORRESPONDENCE #91-507 DATED SEPTEMBER 10, 1991 FROM C.R. SMITH,
SENIOR TRANSPORTATION PLANNER, PARKER CONSULTANTS

CORRESPONDENCE #91-594 DATED OCTOBER 8, 1991 FROM PATRICK REYNOLDS,
PROJECT MANAGER, HIGHWAY 407 STUDIES, MINISTRY OF TRANSPORTATION

RECOMMENDATIONS

1. THAT Regional Council endorse the technically preferred route for the proposed Highway 407/Transit Transportation Corridor in the Region of Durham;
2. THAT the Ministry of Transportation be requested to consider the issues identified in this Report during subsequent refinements to the alignment of the technically preferred route.

1. Background

- 1.1 On December 12, 1990 Regional Council endorsed the recommendations of Commissioner's Report Nos. 90-238P and 224-90W which included a preferred alternative alignment for the Highway 407/Transit Transportation Corridor in the Region of Durham. This alignment was considered to most appropriately support the anticipated structure of urban development in the

Region. As noted in the Report, the assessment was undertaken without the benefit of quantifiable data concerning the impacts on the natural environment and the agricultural community.

- 1.2 On June 5, 1991, Regional Council adopted a new Region of Durham Official Plan which indicated a revised alignment for Highway 407. In general, the primary differences between the alignment illustrated compared to the original Council preferred alternative alignment are as follows:
 - i) in the Town of Pickering, the revised alignment deflects north of Highway 7 west of Greenwood and continues east along the mid-point between the 7th Concession and Highway 7; and
 - ii) in the eastern portion of the City of Oshawa and in the Town of Newcastle the revised alignment deflects south adjacent to the TransCanada Pipe Line right-of-way to between the 6th Line and the 5th Line.
- 1.3 During June of 1991, representatives of The Ministry of Transportation presented the technically preferred route for the Highway 407/Transit Transportation Corridor to each affected area municipal council and to a joint meeting of the Region's Works and Planning Committee. Numerous public information centres were also conducted where comment and input from the public was solicited. This technically preferred alignment is identified in Attachment No. 1 (distributed to members of Planning and Works Committees under a separate cover).
- 1.4 To determine the technically preferred route, the route selection team considered impacts related to the natural, social, economic and cultural environments; agriculture; and transportation/engineering issues. The means by which these factors were quantified and measured is described in Attachment No. 2. The actual significance of specific factors such as the impact on fisheries compared to existing agricultural operations or to the cost of the facility is illustrated in Attachment No. 3.
- 1.5 The basic rationale for each segment of the technically preferred route in Durham can be summarized as follows:
 - i) South of Green River and Brougham rather than north because of the greater potential to meet the objectives of the Seaton and Pickering Airport initiatives, fewer social impacts in Green River and Brougham, fewer constraints related to stormwater management objectives, fewer cultural impacts in Brougham, and the preservation of significant woodlots in the area.

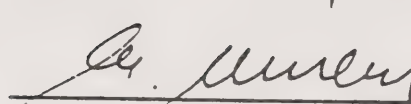
- ii) North of Greenwood and Highway 7 rather than south because the southern alignment would result in greater impacts on the natural environment, more severely impact the community of Greenwood, have less desirable road design characteristics, and would result in greater impacts to the Heber Down Conservation Area and the Macedonian Village.
- iii) South of Brooklin rather than north because of fewer environmental and social impacts, and because the resulting transportation network would best meet local and Regional travel demands.
- iv) In the City of Oshawa and the Town of Newcastle, the alternatives were reduced to three basic choices; a southern alignment, a central alignment and a northern alignment. The identification of the southerly route as a preferred route, represented trade-offs between impacts on the natural environment, agricultural activities, basic transportation and engineering considerations and the desired urban form (particularly in the City of Oshawa). The southern route resulted in the least impact to natural environment by avoiding sensitive headwater areas as well as having the least impact on important agricultural lands and some of the more significant agricultural operations. The southern alignment also provided the most desirable location for the facility with regard to transportation/engineering considerations.


2. Comments

- 2.1 The concept of a major east-west freeway located north of Highway 401 was first developed in the 1950's. During the 1960's and 1970's various planning studies were initiated to define the alignment for this facility from Highway 401 in the Region of Peel to Highway 48 in the Region of York. A conceptual alignment for Highway 407 in the Region of Durham was illustrated in the Official Plan adopted by Regional Council in 1976 and subsequently approved by the Ministry of Municipal Affairs. Following confirmation of the need for Highway 407 from Highway 48 to Highway 35/115, the process to define an appropriate route in Durham was initiated. The identification of the technically preferred route represents a timely and important phase in the planning of a transportation network required to support the anticipated structure of development in the Region.
- 2.2 While the technically preferred alignment for Highway 407 is consistent with the alignment in the Region's Official Plan adopted by Regional Council on June 5, 1991, the Plan also indicates that an arterial road by-pass of the Brougham and Greenwood communities would be appropriate. Although the planning of these facilities would be a Regional

responsibility, the implementation of these initiatives should not be precluded during the more detailed preliminary design phase of this Highway 407 route alignment process. Similarly, consideration of a possible Highway 12 by-pass of Brooklin should also not be precluded. In the City of Oshawa, it is assumed that the provision of a "transit transportation" related facility (which is indicated adjacent to the Highway 407 alignment) would be flexible and able to most appropriately meet the needs of the planned Main Central Area in Oshawa in a manner to be determined at a later date.

- 2.3 During subsequent phases of the route selection process, further details including the impact on the Region's arterial road system will be examined by staff from the Region's Planning and Works Departments. Regional Council will be provided additional opportunity to address these items as they may arise. Regional Council will also be forwarded a report at a later date to address the provision of north/south freeway connections between Highway 401 and Highway 407.
- 2.4 In summary, the preferred route represents logical alignment which balances competing interests and provides the most appropriate location for this essential transportation facility.

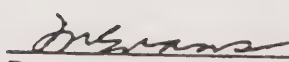

Dr. M. Michael, M.C.I.P.
Commissioner of Planning


V. Silgailis, P. Eng.
Commissioner of Works

HD

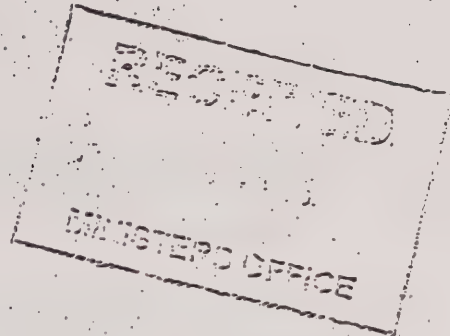
- Attachments: No. 1 - Brochure No. 3, Highway 407/Transit Transportation Route Planning and Environmental Assessment Study, Hwy. 48 to Hwy. 35/115 (distributed under separate cover to members of Planning and Works Committees)
- No. 2 - Factors considered during the Route Selection Process
- No. 3 - Factor Significance Rating

RECOMMENDED FOR PRESENTATION TO COMMITTEE


D. R. Evans, P.Eng., C.A.O.



October 29, 1996



The Honourable Al Palladini
Minister of Transportation
3rd Floor, Ferguson Block
77 Wellesley Street West
Toronto, Ontario
M7A 1Z8

Highway 407 Extension - Our File: T04-3

Honourable Sir, I advise that at their meeting held on October 23, 1996, Regional Council unanimously passed the following resolution:

- "a) THAT the Region of Durham supports the Ministry of Transportation's decision to proceed with Environmental Assessments for the interim and complete extensions of Highway 407 easterly from Highway 48;
- b) THAT the Region of Durham supports construction of the Highway 407 interim extension easterly to the Highway 7/Brock Road area at the earliest opportunity;
- c) THAT the Region of Durham continues to support the expedited extension of Highway 407 easterly to link with Highway 401 in the vicinity of Courtice Road (Regional Road 34), in accordance with Regional Council's position stated through Commissioner's Report #95-J-1;
- d) THAT the Region of Durham continue to support the ultimate completion of Highway 407 to Highway 115/35 and urges that all necessary steps be taken to expedite this project; and

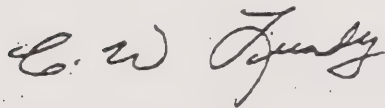
The Regional
Municipality
of Durham
Clerk's Department

505 Rossland Rd. East
P.O. Box 623
Whitby, Ontario
Canada L1N 6A3
(905) 668-7711
Fax: (905) 668-9963

C. W. Lundy A.M.C.T.
Regional Clerk

- e) THAT a copy of Commissioners' Report #96-J-21 be forwarded to the area municipalities, the Minister of Transportation and Durham Region M.P.P.'s."

Enclosed for your consideration is a copy of Report #96-J-21 of our Commissioners of Planning and Works.



C.W. Lundy, A.M.C.T.
Regional Clerk

CWL/db
Encl.

cc: The Honourable J. Ecker, M.P.P. (Durham-West)
Ms. J. Munro, M.P.P. (Durham-York)
Mr. J. Ouellette, M.P.P. (Oshawa)
Mr. J. O'Toole, M.P.P. (Durham East)
Mr. J. Flaherty, M.P.P. (Durham Centre)
Ms. P.L. Barrie, Clerk, Municipality of Clarington
Mr. E.S. Cuddie, Clerk-Administrator, Township of Scugog
Mr. M. de Rond, Clerk, Town of Ajax
Mr. G.S. Graham, Clerk-Administrator, Township of Brock
Mr. B.C. Suter, Clerk, City of Oshawa
Mr. B. Taylor, Clerk, Town of Pickering
Mr. W.E. Taylor, Clerk, Township of Uxbridge
Mr. D.G. McKay, Clerk, Town of Whitby
Mr. A.L. Georgieff, Commissioner of Planning
Mr. V.A. Silgailis, Commissioner of Works

Enclosure Forwarded



Joint Report to Planning and Works Committees

Joint Report No. 96-J-21

Date: October 15, 1996

SUBJECT

Highway 407 East Partial Extension Environmental Assessment Study,

File: 4.4.18.6

Communication dated October 3, 1996 from Mr. Paul Jankowski, P.Eng., Project Director, Highway 407 East Studies, Ministry of Transportation

RECOMMENDATIONS

- A. THAT the Region of Durham supports the Ministry of Transportation's decision to proceed with Environmental Assessments for the interim and complete extensions of Highway 407 easterly from Highway 48;
 - B. THAT the Region of Durham supports construction of the Highway 407 interim extension easterly to the Highway 7/Brock Road area at the earliest opportunity;
 - C. THAT the Region of Durham continues to support the expedited extension of Highway 407 easterly to link with Highway 401 in the vicinity of Courtice Road (Regional Road 34), in accordance with Regional Council's position stated through Joint Report No. 95-J-1; and
 - D. THAT copies of Joint Report No. 96-J-21 be forwarded to the area municipalities, the Minister of Transportation, and Durham Region M.P.P.s.
-

REPORT

1. Purpose of this Report

- 1.1 The Ministry of Transportation (MTO) has recently initiated an Environmental Assessment (EA) study for an interim extension of Highway 407 easterly from its temporary terminus at Markham Road (Highway 48) to the Highway 7/Brock Road area. This report:

Joint Report No. 96-J-21

- discusses the basis for this decision, which was the Highway 407 East Partial Extension Feasibility Study;
 - outlines the process for the EA study;
 - examines the implications of the extension to the Region; and
 - presents the next steps.
2. History of Highway 407 East and the Partial Extension Feasibility Study
- 2.1 Highway 407 was originally proposed in the 1950's to provide an alternative east-west freeway route parallel to and north of Highway 401 across the Greater Toronto Area. In the early 1970's, a planning study was initiated to determine the precise route for Highway 407 East. This study was later cancelled when the Federal Government ceased work on the Pickering Airport.
- 2.2 Planning for Highway 407 East, from Markham Road (Highway 48) to Highway 35/115, finally commenced in 1988. Following extensive public consultation and analysis, a technically preferred route for Highway 407 through Durham Region was identified in 1991. The route was endorsed by Regional Council through joint Planning and Works Commissioner's Report No. 91-J-31 (appended as Attachment 1), and was later adjusted in the Oshawa area through Planning Commissioner's Report No. 94-P-54. This technically preferred route is designated in the Regional Official Plan.
- 2.3 In January 1996, MTO initiated the Highway 407 East Partial Extension Feasibility Study (the Feasibility Study). The purpose of the Feasibility Study was to identify potential solutions to the traffic and environmental impacts expected to occur when Highway 407 opens to Markham Road in 1998. Planning Commissioner's Reports Nos. 96-P-21 and 96-P-39 Informed Planning Committee and Regional Council of the study. The Works Department also presented similar information to Works Committee at their meeting on April 2, 1996.
- 2.4 Although a number of potential solutions were considered, four general alternatives were examined in detail during the Feasibility Study:



File A 2310.33

The Corporation
of the
Town of Pickering

Clerk's Department
(416) 420-4611

November 22, 1990

Pickering Civic Centre
One The Esplanade
Pickering, Ontario
Canada, L1V 8K7
(416) 420-2222
(416) 463-2780
Fax (416) 420-0515

The Honourable Ed Philip
Minister of Transportation
1201 Wilson Avenue
Downsview, Ontario
M3M 1J8

Subject: Proposed Highway 407

Please be advised that the Council of the Town of Pickering passed the following resolution at its regular meeting of November 19, 1990.

Whereas the Ministry of Transportation has provided various alternatives for the proposed Highway 407 through the Town of Pickering;

Now Therefore the Council of the Corporation of the Town of Pickering hereby endorses alternative S5 - SC2 - C3 - C4 as identified on the "Preferred Alignment - Pickering to Whitby" map as the preferred route at this time for the proposed Highway 407;

and that the Minister of Transportation and the Regional Municipality of Durham be advised of this resolution.

If you have any questions with respect to this matter, please do not hesitate to contact me.

Kathryn McKay, A.M.C.T.
Deputy Clerk

c.c. - R. Hutchinson, Director of Public Works

RECEIVED	
LAVALIN ENGINEERS	
FEB - 4 1991	
Route To:	Init.
160	41
File:	



The Corporation
of the
Town of Pickering

Clerk's Department
(416) 420-4611

Pickering Civic Complex
One The Esplanade
Pickering, Ontario
Canada L1V 6K7
(416) 420-2222
(416) 683-2760
Fax (416) 420-0515

File A 2310.33

March 3, 1992

Mr. P.J. Reynolds
Project Manager
Ministry of Transportation
Central Region, 3rd Floor
Atrium Tower
1201 Wilson Avenue
Downsview, Ontario
M3M 1J8

Subject: Highway 407 Transportation Corridor

Please be advised that the Council of the Town of Pickering passed the following resolution at its regular meeting of March 2, 1992.

That Town Council endorse in principle the "technically preferred route" for the Highway 407 Transit/Transportation Corridor across Pickering as identified in May 1991 by the Ministry of Transportation through its Route Planning and Environmental Assessment Study.

If you have any questions with respect to this matter, please contact Mr. Thomas Melymuk, Deputy Director of Planning at extension 2037.

Bruce Taylor, AMCT, CMM
Town Clerk

c.c. - Neil Carroll, Director of Planning



Recorded Vote:

Yes: Councillors Dickerson, Pistrino, Ryan, Senis and Mayor Arthurs
 No: Councillor Johnson
 Absent: Councillor Brenner

Resolution #114/96

Moved by Councillor Senis
 Seconded by Councillor Johnson

1. That Council request the Ministry of Transportation to proceed expeditiously with the planning and environmental assessment work relating to the construction of Highway 407 East from Markham Road to Highway 35/115, including the two links with Highway 401; and
2. That Council advise the Ministry of Transportation that it supports a partial extension of Highway 407 East from Markham Road to Brock Road by 1998 only if such extension continues east of Brock Road to join with Highway 7, with the provision of appropriate intersection signalization or partial interchange; and
3. That Council advise the Ministry of Transportation that it does not support any plan for the Partial Extension of Highway 407 East which does not extend to Highway 7 east of Brock Road, including extension options to the Markham Bypass, the Townline Road and Brock Road; and
4. That any partial extension of Highway 407 East include provision for the introduction of a continuous east/west bikeway route within the new Highway 407 corridor.

CARRIED

Resolution #115/96

Moved by Councillor Johnson
 Seconded by Councillor Dickerson

That the Council of the Corporation of the Town of Pickering hereby endorses the application for a Certificate of Approval by 1151162 Ontario Inc. to operate a waste transfer and material processing facility at 1220 Squires Beach Road and further confirms that the subject site is properly zoned to permit the intended use; and

That the waste be taken from Durham only sources.

CARRIED

Councillor Senis declared an interest as her husband was involved in the purchase of this property

APPENDIX 18
SUMMARY OF PUBLIC
CONSULTATION SESSIONS

1

(1)

(1)

**PUBLIC INVOLVEMENT
RESULTS OF PUBLIC INFORMATION CENTRES
ROUTE PLANNING PHASE
MAY 15, 16, 17, 23, 24, 1990**

(3)

(3)

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3.0 PUBLIC NOTIFICATION OF THE INFORMATION CENTRES	3
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APPENDICES

Appendix 1	-	Information brochures
Appendix 2	-	Newspaper Advertisements
Appendix 3	-	Special Interest Groups Invitee List
Appendix 4	-	Sample Attendance Sheet and Comment Sheet

LIST OF TABLES

Table 1	Breakdown of Information Centre Attendance
Table 2	Breakdown of Comment Sheet Origin



EXECUTIVE SUMMARY

- This Technical Paper documents the conduct and results of the first series of Public Information Centres held for the Highway 407 Route Planning and Environmental Assessment Study.
- The purpose of these sessions was to provide the general public and special interest groups with information on the preliminary route alternatives that have been developed and the proposed means by which they will be analyzed.
- The information centres, convened during mid-May 1990, included venues in each of the five affected area municipalities. This paper provides details related to the sessions held in the Town of Markham (May 15), the Town of Pickering (May 24) and the Town of Whitby (May 23). The results of sessions in Oshawa and Newcastle have been documented under separate cover.
- Public notification of the information centres included advertisements placed in 15 local and regional newspapers plus householder and direct mail distribution of approximately 22,400 information brochures.
- Information centres adopted a drop-in format and displays included a conventional range of material providing information related to study background, rationale, organization and schedule; results of the data collection phase of the work; the preliminary route alternatives; and proposed evaluation criteria. Emphasis was also placed on the need for MTO and consultant staff to supplement the data base through further public input. This two-way information transfer process proved extremely effective.
- The Markham-Pickering-Whitby centres attracted 863 registrants representing about 750 households and businesses. Attendance was distributed as follows:

204 at Markham
224 at Pickering
435 at Whitby

- Representation from the venue municipality was highest in Whitby (77.1%) and roughly equal at the other two centres (55.0% in Markham and 55.2% in Pickering). Attendees from areas outside the Highway 407 study area comprised approximately 7.8% of the total, with the Town of Ajax being the most heavily represented.
- Comment sheets were provided at the information centres and 143 pertaining to the Markham-Pickering-Whitby area have been received by the Project Team.
- Relative to attendance, response rate was highest in Pickering (30%) and significantly lower in Markham (15%) and Whitby (21%). However, the highest number of responses (62 or 44.6%) originated from Whitby residents.
- Due to the general degree of uncertainty attached to the location of Highway 407 in **MARKHAM**, the primary issues are related not to the Highway location but rather to the relationship between the freeway/transitway facility and the existing and proposed road network in the vicinity of the former Village of Markham. Major concerns/perceptions include:
 - in light of the recent announcement by the Province regarding preservation of the Rouge Valley system, the fate of the Markham Bypass relative to an extension south of Highway 7 or Steeles Avenue and a connection with Highway 407

- undesirable impacts on Markham's Main Street as a result of introducing a Highway 407/Highway 48 interchange
- local and sub-regional traffic operational problems are creating a desire to have both the freeway and transit service or improvements to Highway 7 introduced in the near future. [Within MTO's current construction program, completion of Highway 407 to Highway 48 from the west is scheduled for 2001. The construction program for Highway 407 east of Highway 48 has not yet been determined.]

Other concerns include potential proximity effects, particularly noise and visual impacts, in the vicinity of Chatelaine Drive and Colonel Butler Drive and the nature/location of Rouge River and Little Rouge Creek crossings.

- In PICKERING, the majority (88.5%) of those who made route specific comments are opposed to an alignment in the Fifth Concession which would pass to the south of the Hamlet of Greenwood. The major sensitivities cited in this area included:
 - Greenwood built up area including Pickering Museum and Greenwood Road residences
 - sensitive portions of Duffin Creek valley as related to the Greenwood Conservation Area and fisheries resources
 - costs associated with southern route due to topographical characteristics/soil conditions in Duffin Creek valley between Brock Road and Westney Road. Specific reference was made to high structure crossing Greenwood Road
 - Salem Cemetery

- direct property impacts and proximity effects leading to diminution of property values. Specific reference was made to Staxton Glen and Deercreek Estates residential developments
- Comments from residences in WHITBY related almost exclusively to the manner in which Highway 407 should bypass the Village of Brooklin. Of the 27 respondents who expressed an opinion on which route should be selected 15 (56%) prefer a northern route and 12 (44%) prefer a southern route.

Proponents of a northern route cited the following rationale:

- reduced natural environment impacts in general and impact to Heber Down Conservation Area in particular
- less good agricultural land required
- fewer proximity effects and property disruption
- most direct route to Highway 35/115
- reduced potential for additional traffic operational problems in proximity to southern urban area; southern routes too close to Highway 401

Those who favoured a southern route did so for the following reasons:

- highway 407 would create a buffer between south and north Whitby, and the route adjacent to the Ontario Hydro Gatineau Line would make the best use of an existing barrier, thereby helping to preserve the rural character of north Whitby

- highway 407 would best satisfy the Region of Durham's official plan objectives by placing a cap on Whitby's urban growth and permitting growth in Brooklin to occur in a more controlled manner
- preservation of the integrity and historical character of the Village of Brooklin (reduced potential for through traffic and integration with south Whitby)
- additional cost associated with northern route with respect to earthworks required to replace unsuitable glacial till (south has more accessible sand and gravel resource for roadbed)
- less desirable safety (sight line) characteristics associated with topography on north route
- preservation of upper (coldwater) reaches of Lynde Creek (fisheries production zones)
- less winter maintenance further from Oak Ridges Moraine
- direct property impacts
- greater service potential due to proximity to existing and designated urban areas
- interchange with Thickson Road is required and only the southern routes include this provision

Other comments from Whitby residents addressed the need to focus on ground water impacts (particularly near Macedonian Village); interchange location concerns; construction timing and its relationship to the introduction of municipal services in the Brooklin area; and consideration of established rural/agricultural lifestyle versus short term speculative development interests.

- Comments from attendees residing outside the Highway 407 study area included few route specific references and generally focussed on the need to accelerate implementation of the project.
- All written comments were replied to in kind by either MTO or consultant staff, including an indication as to the sequence of events leading to the next opportunity for formal public involvement. Those with specific concerns were provided with individual responses as deemed necessary.
- As a result of specific suggestions relative to new or modified route alternatives, the Project Team is conducting the appropriate investigations and will document action taken.
- Request for additional meetings with special interest groups have been accommodated.

1.0 INTRODUCTION

As an integral part of obtaining study participants' input in the Development of Alternatives phase of the Highway 407 Route Planning and Environmental Assessment Study, a series of five Public Information Centres were held at the following venues:

- Tuesday, May 15, 1990
Markham Village Community Centre
Highway 48 at Highway 7
Town of Markham
- Wednesday, May 16, 1990
General W. Sikorski Polish Veterans Hall
1551 Stevenson Road North
City of Oshawa
- Thursday, May 17, 1990
Tyrone Community Centre
Tyrone, Town of Newcastle
- Wednesday, May 23, 1990
Luther Vipond Memorial Arena
67 Winchester Road, Brooklin
Town of Whitby
- Thursday, May 24, 1990
Kahn Auction Barns
Brock Road North
Town of Pickering

Each centre was open to the general public between 3:00 p.m. and 9:00 p.m. Identified special interest groups were invited to attend separate sessions between 1:00 p.m. and 3:00 p.m. in conjunction with each information centre. Interest group invitees are listed in Appendix 3 with an indication as to which groups attended these special sessions.

This report outlines the general procedures for public notification and the conduct of the information centres, and documents the results of the centres held in Markham, Pickering and Whitby. The results of the Oshawa and Newcastle (Tyrone) information centres have been documented under separate cover by Parker Consultants.

2.0 PURPOSE OF THE INFORMATION CENTRES

The purpose for conducting the information centres was to introduce the project and provide interested parties with the opportunity of reviewing and commenting on the initial data gathering phase, the preliminary route alternatives and the proposed factors to be used in the analysis and evaluation of the candidate routes. The intent of the centres was formally expressed in the following manner:

1. Provide background information as to why this study has been initiated
2. Explain the objectives of the study
3. Describe the planning process involved and how input to the study is organized
4. Obtain a reaction to the initial data gathering phase and gather additional information related to study area conditions and environmentally sensitive areas/issues

5. Hear views and ideas on the preliminary route alternatives and cross-section proposals which are being considered
6. Hear views and ideas on the methods proposed for selecting the appropriate route alternative

3.0 PUBLIC NOTIFICATION OF THE INFORMATION CENTRES

Arrangements were made to notify the general public of the information centres. This included all resident and non-resident property owners and businesses within the study area. Two mechanisms were adopted to achieve this.¹

1. Mail (general distribution and direct mail)
2. Newspaper notices

3.1 Mail

Information brochures announcing the information centre were distributed to resident property owners and businesses on a household mail delivery basis. Postal stations serving the study area received a total of 21,800 brochures for general distribution.

Study area coverage requirements were determined from written and verbal information received directly from local postal station managers during the Study Initiation notification phase of the study (November 1989). During the May 1990 information sessions it became evident that there was a gap in this information for the northern portion of the City of Oshawa. Action taken by the Project Team in this regard is described in Section 6.0 of this report.

¹ This procedure was established during the Study Initiation phase, during which the same methods were employed (see Appendix 1 and Appendix 2, respectively, for the relevant information brochures and newspaper advertisements)

Approximately 570 non-resident property owners, as identified from municipal property assessment roles, received brochures via first class (direct) mail.

Other direct mailings (approximately 330) included those to the External Team, the Municipal Technical Team, Municipal Clerks (Council and visitor distribution), special interest groups, provincial and federal elected representatives and individuals who requested inclusion on the mailing list.

3.2 Newspapers

Notification appeared in 15 local and regional newspapers two weeks prior to the first information centre. Each of the affected local municipalities were covered, as were the primary geographical areas where non-resident property owners reside.

The Study Initiation and Public Information Centre advertisements, the newspapers utilized and the dates on which the advertisements appeared are included in Appendix 2.

4.0 INFORMATION CENTRE FORMAT AND PROCEEDINGS

The public information session were conducted on a drop-in centre basis. Attendees were requested to register as they entered. A welcome was extended and attendees were invited to inspect the display material. MTO and consultant staff were available for explanation and clarification, which generally proceeded on an individual basis as attendees reviewed the presentation material.

The following material was displayed:

- Recommendations of Highway 407 Overview Study
- Study Area location in the context of the Greater Toronto Area and other freeway network improvement proposals

- Study rationale, need and justification, organization and schedule
- Aerial photomosaic showing existing conditions and Study Area limits
- Environmental Assessment Process flow diagram
- Data displays with route alternative overlays (on 1:10,000 scale property base plan)
 - land use
 - natural environment
 - agriculture
- Consolidated constraint mapping with route alternative overlay (on 1:10,000 scale property base plan)
- Typical cross-section (freeway/transitway) and typical interchange configuration (near/far station schemes)
- Proposed Evaluation Criteria

Staff also established a "resource area" at each centre which was used as a work area and for one-on-one discussions with attendees. Other information on hand, but not displayed, included:

- additional property ownership information
- environmental and engineering data assembly working drawings
- data collection technical working papers
- preliminary route alternative profiles
- traffic modelling road network
- municipal planning and development documents

This material was used extensively throughout the course of the five information centres.

Farm operators were requested to confirm on a plan provided specifically for agricultural information, which parcels of land they own and indicate those others which they are currently working, as well as equipment and livestock routes. The intent of this exercise was to gain an appreciation of contiguous, large parcels of active agricultural land, the extent and distribution of custom work and crop sharing or leasing arrangements and implications relative to the movement of equipment and livestock.

Once participants had reviewed the proposals they were asked to complete a comment sheet, including mailing and property ownership addresses, to be left at the centre or mailed to the MTO Transportation Planning Section within two weeks (see Appendix 4 for sample Registration Sheet and Comment Sheet).

5.0 ATTENDANCE AND SUMMARY OF COMMENTS RECEIVED

5.1 Attendance

Response to the information centres was considered extremely favourable in terms of attendance. A total of 863 registrants, representing 747 households and businesses, was recorded at the Markham, Pickering and Whitby centres. Table 1 provides a breakdown of total attendance by information centre venue and a geographical distribution of attendees.

Representation from the venue municipality was highest in Whitby (77.1%) and roughly equal at the other two centres (55.0% in Markham and 55.2% in Pickering).

Representation from the Oshawa-Newcastle section of the study area was highest at the Whitby venue (12.2%) and lowest at Markham (0.5%). Conversely, representation from Metropolitan Toronto was highest at Markham (14.1%) and lowest at Whitby (2.5%).

Attendees from other areas comprised approximately 7.8% of the total, with the Town of Ajax being the most heavily represented.

TABLE 4

BREAKDOWN OF INFORMATION CENTRE ATTENDANCE

<u>VENUE</u>	Total <u>Registrants</u>	<u>DISTRIBUTION</u>						<u>No Address</u>	<u>Total</u>
		<u>Marham</u>	<u>Pickering</u>	<u>Whitby</u>	<u>Oshawa</u>	<u>Newcastle</u>	<u>Metro</u>		
Markham	204	105	20	11	0	1	27	4	191
Pickering	224	4	107	29	7	2	20	2	194
Whitby	435	2	14	279	32	12	9	3	362
TOTALS	863	111	141	319	39	15	56	9	747

Notes:

1. Total registrants includes all those who signed the Attendance Sheets and likely represents 90-95% of all attendees.
2. Geographical distribution is generally indicative of the number of households or businesses represented from each municipality; therefore, totals do not correspond to total registrants.
3. Distribution of "Other" registrants excludes those who did not indicate on address (approximately 1.0% of all registrants).
4. Figures include attendance at more than one venue.

Copies of Attendance Sheets are on file with the Ministry of Transportation.

5.2 Comments

A total of 139 Comment Sheets have been received to date and they reflect the attendance levels generated at each of the three information centre venues in the West Section of the study area. About 48% of all comments were received at the Whitby venue, while those received at Pickering (36) and Markham (27) represented 25.2% and 18.9% of the total respectively. Twelve Comment Sheets were completed by West Section study area residents attending either the Oshawa or Newcastle information sessions. Table 2 provides a breakdown of Comment Sheet origin by municipality.

Forty-six percent of all comments and concerns pertaining to the West Section study area emanated from Whitby residents, while comments from Pickering and Markham residents comprised 29.4% and 11.9% of the total respectively. The reasons for the lower degree of response in Pickering may be attributable to the relatively high level of leasehold property occupancy. [It should be noted, however, that Pickering exhibited the highest rate of response relative to attendees from the municipality (30%).] This may also be valid as a rationale for the low response in Markham but a more likely explanation is the smaller proportion of the study area involved (15%) and the high degree of certainty attached to the location of the route between Highway 48 and Ninth Line.

Responses from Metro Toronto and elsewhere (primarily Ajax) comprised about 12% of the total and one respondent did not provide an address.

The following sections provide a summary of comments received by municipality, including an indication of route preferences and associated rationale. Brochure No. 2 in Appendix 1 shows the location of the route alternatives presented at the information centres. Comment sheets are on file with the Ministry of Transportation.

TABLE 2

BREAKDOWN OF COMMENT SHEET ORIGIN

<u>VENUE</u>	<u>Total</u>	<u>Markham</u>	<u>Pickering</u>	<u>Whitby</u>	<u>Metro</u>	<u>Other</u>	<u>No Address</u>
Markham	27	16	4	1	4	2	0
Pickering	36	0	25	3	2	6	1
Whitby	68	1	10	53	1	2	0
Oshawa	11	0	3	8	-	-	-
Newcastle	1	0	0	1	-	-	-
TOTALS	143	17	42	66	7	10	1
(%)	(100)	(11.9)	(29.4)	(46.1)	(4.9)	(7.0)	(0.7)

5.2.1 Town of Markham

Approximately 15% of Markham households represented provided comments. Of the 17 comment sheets received from Markham residents, only 3 indicated a route preference. Again, this may be attributable to the leasehold tenure on most properties (perceived lack of vested interest) and the degree to which the route is fixed between Highway 48 and Ninth Line. The 2 individuals indicating a preference for a northern route may have been relating their comments to the entire study area since the rationale provided addressed the element of area wide traffic service (i.e. southern route is too close to Highway 401 and development is moving north; provide sufficient space for development between Highway 7 and Highway 407 to the north). The respondent with a preference for a route passing south of Locust Hill provided no rationale for her comment.

A more pervasive issue than the location of the route itself appears to be the relationship between Highway 407 and the existing and proposed road network in the vicinity of the former Village of Markham. The thrust of the comments is related to the need for a connection between Highway 407 and the Markham Bypass to best serve N-S/E-W connection of regional traffic in the area. Related to this is the perception that an interchange between Highway 407 and Highway 48 is not in the best interest of serving regional traffic or preserving the character of Markham's main street (i.e. widening beyond current 2-lane configuration). The cases of other local bypasses (Brampton, Guelph, Lindsay) were cited as examples of the manner in which traffic could/should be diverted from the Village. Further, there is a perception that the inter-changes at McCowan Road, Highway 48 and Ninth Line are too closely spaced so the one at Highway 48 could be dropped.

The other primary issue in Markham appears to be the timing of project implementation. Local and sub-regional traffic operational problems are creating a desire to have both the freeway and transit service or improvements to Highway 7 introduced in the near future. [Within MTO's current construction program, completion of Highway 407 to Highway 48 from the west is scheduled for 2001. The construction program for Highway 407 east of Highway 48 has not yet been determined.] Comments of this nature are also typical of those made by attendees from Metro and adjacent municipalities.

Other comments received from Markham residents included:

- General opposition to road network improvements and the desire to see more emphasis on introducing transit network improvements and promotion of transit use to reduce adverse natural environmental impacts and preserve good agricultural land.
- Concern that Seaton will not be sufficiently served by a station in the freeway right-of-way. The route by regional transit in and out of Seaton should be subordinate to the best station location for long-haul transit.
- Desire to have noise attenuation measures included in the facility cross-section and a preference for earthen berms as opposed to walls.
- Relative to the timing issue, the perceived need to carry the Highway 407 construction from the west easterly to Ninth Line (specifically to serve Markham-Stouffville Hospital traffic) instead of terminating at Highway 48.
- Concern over the crossing of the Rouge River.
- Exploit opportunities to use natural resources (cut section, landscaping) to reduce adverse aesthetic and noise impacts to residential areas; strategic directional illumination techniques.

5.2.2 Town of Pickering

Of the 42 responses received from Pickering residents, 26 (61.9%) included route specific comments and 24 indicated a preference. Nineteen respondents would prefer a route north of Highway 7 (Central Alternative). This excludes 2 responses opposed to a route in the Fifth Concession with no indication of a preferred route. It also excludes 2 responses indicating a preference for a southern route with a crossover to the Central Alternative west of Greenwood. Three respondents preferred the South Alternative.

In summary, it is evident that the majority (88.5%) of those who made route specific comments are opposed to an alignment in the Fifth Concession which would pass to the south of the Hamlet of Greenwood. The following reasons were cited in support of this position:

- a) The most northerly route would do the most to ensure that development does not outstrip freeway infrastructure (i.e. another major east-west facility required in 20-30 years).
- b) Avoidance of Greenwood built up area including Pickering Museum and Greenwood Road residences.
- c) Avoidance of the most sensitive portions of Duffin Creek as related to the Greenwood Conservation Area and fisheries resources.
- d) Increased costs associated with southern route due to topographical characteristics/soil conditions in Duffin Creek valley between Brock Road and Westney Road. Specific reference was made to high structure crossing Greenwood Road.
- e) Encroachment on Salem Cemetery.

- f) Direct property impacts and proximity effects leading to diminution of property values. Specific reference was made to Staxton Glen and Deercreek Estates estate residential developments.
- g) Proposed arterial road improvements (Taunton-Steeles corridor) will provide sufficient service in the area.
- h) General concern with the prospect of an interchange at Westney Road and the potential effects on the character of Greenwood.

Those in favour of the South Alternative provided the following rationale:

- a) Southern route will cross fewer streams and springs. Specific reference was made to 'Glenstream' area north of Green River.
- b) Less costly
- c) Affects less viable agriculture
- d) Closer to sand and gravel resources for roadbed

Two other respondents suggested expanding the study area to the south to include a route option south of the Fifth Concession to avoid prime farmland.

Other comments received from Pickering residents included the following:

- Highway 407 is greatly needed; proceed to construction as soon as possible.
- General opposition to road network improvements and the desire to see more emphasis on introducing transit network improvements and promotion of transit use to reduce adverse natural environmental impacts and preserve good agricultural land.

- The Province should be considering improvements to existing roadways over the introduction of new highway facilities
- Give primary consideration to potential effects to surface watercourses from highway stormwater runoff and effects on ground water resources (i.e. shallow dug wells).
- General concern with noise impacts.

5.2.3 Town of Whitby

Approximately 21% of residents attending from Whitby provided comments.

The predominant issue in Whitby is the manner in which the freeway/transitway should bypass the Village of Brooklin. The perceived elements associated with the rationale for a northern or southern routing are:

- 1) Rural character of North Whitby
- 2) Historical character/integrity of the Village
- 3) Preservation of agricultural land/operations
- 4) Preservation of the natural environment
- 5) Traffic service
- 6) Proximity effects and direct property impacts (noise, visual, value diminution)

Of the 66 respondents from Whitby, 27 (40.9%) expressed a route preference; all were related to whether Highway 407 should bypass Brooklin to the north or the south.

Fifteen (55.6%) of those who expressed a preference cited a northern alternative as the desirable option for the following reasons (bracketed figures indicate number of instances cited):

- a) To reduce natural environmental impacts in general and impacts to Heber Down Conservation Area in particular (3)
- b) Less good agricultural land required (1)
- c) Fewer proximity effects and property disruption (3)
- d) Most direct route to Highway 35/115 (2)
- e) Reduced potential for additional traffic operational problems in proximity to southern urban area; southern routes too close to Highway 401 (2)

Other respondents desiring the northern route gave no reasons for their preference.

Twelve (44.4%) of those who expressed a preference would like to see a southern route implemented on the following basis:

- a) Highway 407 would create a buffer between south and north Whitby, and the route adjacent to the Ontario Hydro Gattineau Line would make the best use of an existing barrier, thereby helping to preserve the rural character of north Whitby (2)
- b) Highway 407 would best satisfy the Region of Durham's official plan objectives by placing a cap on Whitby's urban growth and permitting growth in Brooklin to occur in a more controlled manner (2)

- c) Preservation of the integrity and historical character of the Village of Brooklin (reduced potential for through traffic and integration with south Whitby) (4)
- d) Additional cost associated with northern route with respect to earthworks required to replace unsuitable glacial till (south has more accessible sand and gravel resource for roadbed) (2)
- e) Less desirable safety (sight line) characteristics associated with topography on north route (1)
- f) Preservation of upper (coldwater) reaches of Lynde Creek (fisheries production zones) (1)
- g) Less winter maintenance further from Oak Ridges Moraine (2)
- h) Direct property impacts (3)
- i) Greater service potential due to proximity to existing and designated urban areas (3)
- j) Interchange with Thickson Road is required and only the southern routes include this provision (1)

Other comments and concerns included the following:

- Concerns of established community (prime farmland, rural lifestyle) should be given higher priority than those of speculative interests.
- Timing connection between introduction of the freeway/transitway facility and the extension of municipal services to the area.
- Impacts to natural wildlife corridors in stream valleys.

- Lack of need and justification for the facility; downscale to 4-lane arterial with transit in median; put more emphasis on improving existing highway network and rail passenger service.
- Given the need for interchanges at Durham Road 23 and Highway 7/12, an interchange at Durham Road 41 (Ashburn Road) is unwarranted and undesirable due to potential traffic impacts to residential development and existing lack of continuity on Ashburn Road.
- Adopt a route north of the study area where development is not as dense and property is not as valuable.
- Interchange with Thickson Road is more desirable than one with Highway 12 due to potential for increased traffic on Highway 12 through Brooklin and resultant pressure for widening which would adversely affect business operations on Baldwin Street (Highway 12).
- Public should be advised of construction schedule now to eliminate uncertainty and the project should be implemented as soon as possible to reduce further cost.
- Following existing east-west road corridors makes more sense than displacing existing strip residential development off the concession roads.
- Impacts to ground water resources in the areas south of Highway 7 (current interception problems at Macedonian Village were cited).
- Introduce a parkway belt concept similar to that west of Highway 48 (i.e. route south of Brooklin in conjunction with the Ontario Hydro Gatineau Line and associated open space).

- Specific concerns related to direct property impacts (residential and agricultural operations).
- General opposition to highway network expansion at the provincial level and emphasis on promoting public transit on the basis of reducing adverse environmental impacts.

5.2.4 Metropolitan Toronto/Other

Approximately 12% of the comment sheets received originated from residents outside the affected municipalities. Seven of the 10 outside Metro were completed by Ajax residents. The majority of Metro responses were from Scarborough residents.

Two of the project specific comments from Ajax residents related to concern over having Highways 401 and 407 a sufficient distance apart to promote orderly development and reduce the potential for additional traffic operational problems.

In addition, the President of the Metro East Steelhead and Salmon Fishermen (Ajax resident) submitted concerns relative to fishery habitat and spawning areas from Markham to Newcastle. A preference for the most northerly route possible was cited due to the limited production zones affected as a result of barriers to migratory species on the Duffin Creek system at Whitevale and Greenwood.

Metro responses addressed the following issues:

- Economic implications of not implementing the proposed road/rail improvements, plus the Pickering Airport facility, in the short term (within 10 years).
- Impacts to good agricultural land; preference for expanded GO Service based on lower cost factor.

- Give precedence to use of previously disturbed corridors (hydro, rail existing roads).
- Avoidance of forested areas, watercourse confluence areas, direct stormwater runoff to creeks, clear cutting in right-of-ways. Preference expressed for Link S3 to avoid relocation of Highway 7 to cross Little Rouge Creek or modified S3 to cross Little Rouge Creek south of CP Rail line where valley is narrower.
- Impacts of Morningside Avenue corridor 401-407 connection (preference for Altona Road or Brock Road corridor option).
- General opposition to road network improvements and the desire to see more emphasis on introducing transit network improvements and promotion of transit use to reduce adverse natural environmental impacts and preserve good agricultural land.

6.0 ACTION BY PROJECT TEAM

All written comments were replied to in kind by either MTO or consultant staff, including an indication as to the sequence of events leading to the next opportunity for formal public involvement. Those with specific concerns were provided with individual responses as deemed necessary. These responses are also on file with the Ministry of Transportation.

The Municipal Technical Team received copies of this technical paper for information purposes. Municipal Councils also received a copy of this technical paper through their respective Clerks.

As a result of specific suggestions relative to new or modified route alternatives, the Project Team is conducting the appropriate investigations and will document action taken.

Approximately 40 information packages were sent to resident and non-resident property owners in Concession 7 Oshawa to account for the possibility that owners in this area did not receive notification or were otherwise not made aware of the public information centres. The package included Brochure No. 1, Brochure No. 2, a 1:10,000 scale plan of route alternatives currently being considered in the City of Oshawa, a comment sheet and a covering letter explaining the situation. The number of properties affected represents about 0.2% of all general public notification brochures distributed.

Additionally, in response to requests for meetings with groups representing local and area wide interests, members of Project Team met with:

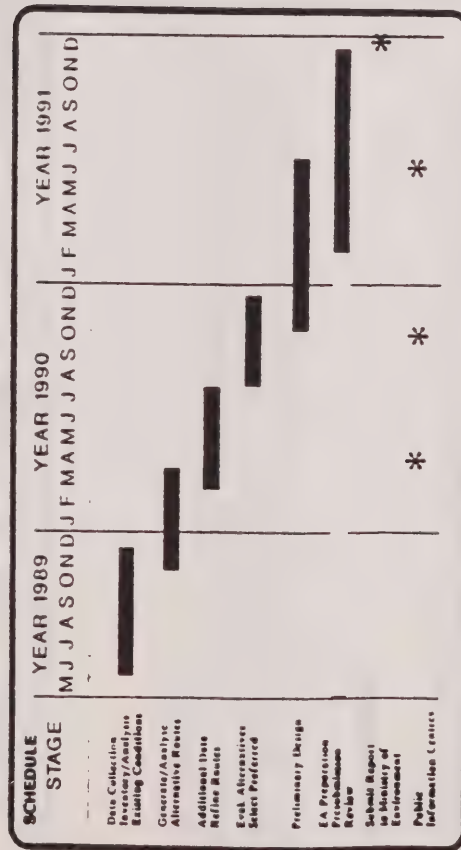
- 1) The Durham Conservation Council (June 1990)
- 2) The Whitevale and District Residents' Association (June 1990)

APPENDIX 1
INFORMATION BROCHURES

BROCHURE NO. 1
STUDY INITIATION

ENVIRONMENTAL ASSESSMENT

This study is subject to the full requirements of the Environmental Assessment Act. An Environmental Assessment Report will be submitted to the Ministry of the Environment on completion of the study. Approval will be requested to designate and protect a corridor, to purchase property for the freeway and the transit rights-of-way and to design, construct and operate the freeway in the future. Comments and information regarding this study are being collected to assist MTO in meeting requirements of the Environmental Assessment Act. Information and comments regarding the study will be maintained as a public data base and will be kept on file for use during the study, and unless otherwise requested, may be included in study documentation which is made available for public review.



CURRENT STAGE - DATA COLLECTION

Information on all engineering and environmental aspects of the study area is being collected and assessed prior to the generation of alternative routes. This information includes the input of other government Ministries and agencies, municipalities and utilities. All members of the general public, interest groups and individuals, are also welcome to provide any comments they may have at this time regarding the Data Collection Stage or the project in general. Please contact one of the Project Team members listed in this brochure.

PUBLIC INVOLVEMENT GENERAL

The Ministry of Transportation will carry out a program to encourage public input and to provide for public review of study findings and recommendations at key stages of the study. This will include information brochures, newspaper advertisements, direct mailings and public information centres. Comments and questions are welcome at any time. Contact one of the Project Team members listed in this brochure.

WHAT HAPPENS NEXT?

Public information centres are planned for spring, 1990 for review and comment on the Data Collection Stage and the Alternative Routes developed by the Project Team.



Ministry of
Transportation

Ontario

Hwy. 407

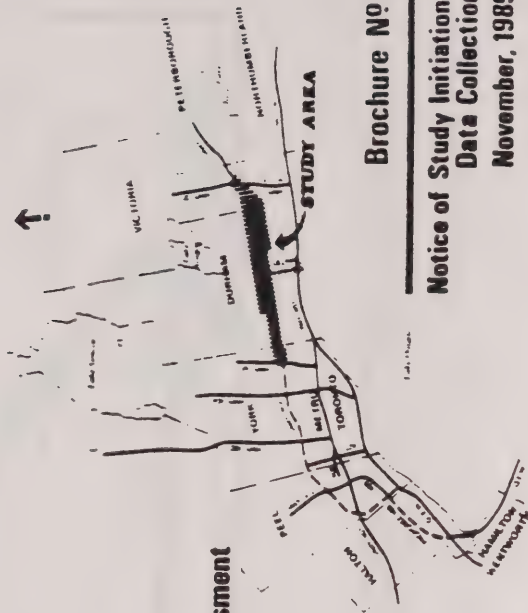
Route Planning and Environmental Assessment Study

Hwy. 48 to Hwy. 35/115

Brochure No 1

W.P. 282-86-01
and
W.P. 326-88-01

Notice of Study Initiation/
Data Collection
November, 1989



ADDITIONAL INFORMATION

If you would like further information please contact one of the following Project Team members.

CONSULTANTS

West Section - WP 282-86-01
(Hwy. 48 east to Whitby/Ontario Boundary)

East Section - WP 326-88-01
(Whitby/Ontario Boundary east to Hwy. 48/115)

Mr. Ari Minchev, or
Mr. Ian Uppjohn
I I NCO Engineers Inc.
Atria North - Phase II
2215 Sheppard Avenue East
WilLOWdale, Ontario, M2J 5A6
(416) 756-1133

Mr. Doug Gault, or
Mr. Ray Smith
Parker Consultants Limited
1400 Rymal Road East
Hamilton, Ontario, L0R 1P0
(416) 853-1214

MINISTRY OF TRANSPORTATION

Project Manager - Highway 407 Route
Planning Study (Hwy 48 to Hwy 45, 115)

Environmental Coordination - Highway 407
Planning Study (Hwy 48 to Hwy 45, 115)

Mr. Patrick Reynolds
MTO Central Region
Ted Fournier Tower
1201 Wilson Avenue
Downsview, Ontario, M3M 1T8
(416) 235-5482

Mr. A. Jay Nuttall
MTO Central Region
5th Floor, Atrium Tower
1201 Wilson Avenue
Downsview, Ontario, M3M 1T8
(416) 235-5515

HIGHWAY 407 FROM HIGHWAY 48 TO HIGHWAY 35/115

This introductory brochure is the first in a series that will advise the public of progress and announce information centres where study findings and recommendations will be presented for public review and comment.

The Highway 407 concept was developed in the 1950's to provide a bypass of Metropolitan Toronto. In the mid-1960's, engineering studies were carried out to determine the location of Highway 407 and in the 1970's Highway 407 was examined as part of a multi-purpose utility corridor, urban separator and linked open space system from Hamilton east to Highway 48 in Markham. This "Parkway Belt West Plan" was formally approved in July, 1978. Highway 407 from Highway 403 in Mississauga to Highway 48 in Markham is now designed and protected as part of that plan.

The need for this section of Highway 407 was recognized in previous studies and reconfirmed in 1989 by a Ministry of Transportation "Overview Study". An assessment of future growth in the Regional Municipalities of York and Durham concluded that a Highway 407 freeway from Highway 48 to Highway 35/115 will be required. The study also recommended that there is an **immediate need to identify** and to protect potential transportation corridors due to the pressures for development in these areas.

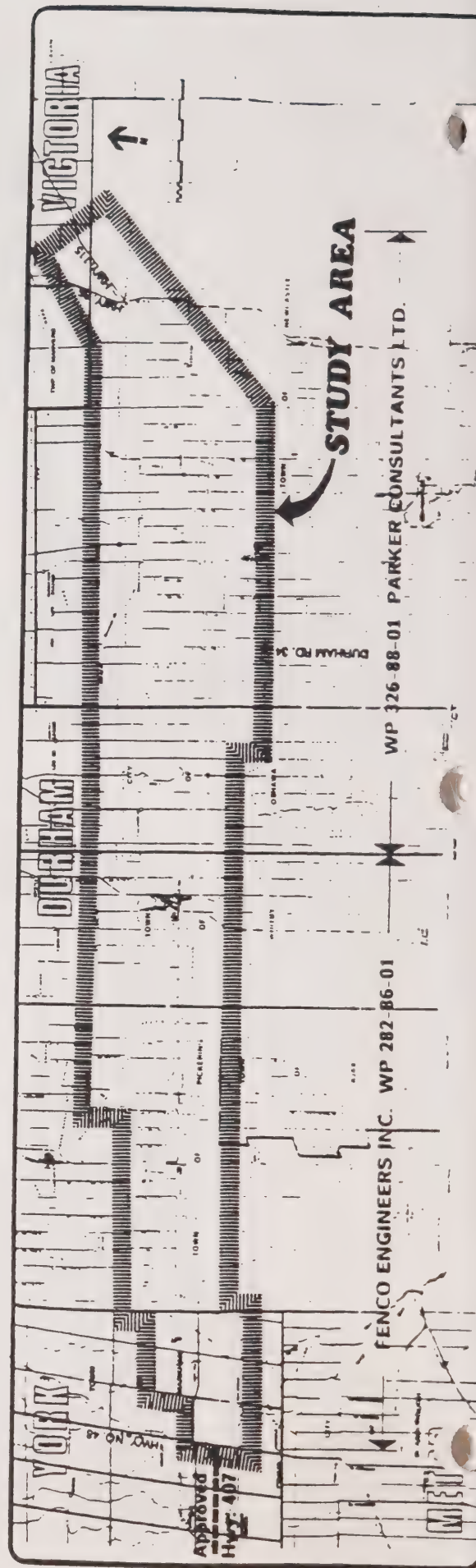
PURPOSE OF THIS ROUTE PLANNING STUDY

- As recommended by the "Overview Study" this study will determine and obtain approvals for
- an ultimate 10 lane freeway from Highway 48 to the vicinity of Durham Road 34;
- an interregional transit right-of-way from Highway 48 to the vicinity of Durham Road 34;
- an ultimate eight lane freeway from the vicinity of Durham Road 34 to Highway 35/1

STUDY AREA

Alternative routes for proposed Highway 407 and the transit right-of-way will be developed in the study area outlined below.

Alternative routes have not yet been identified. (Although the Regional Municipality of Durham Official Plan indicates a Highway 407 corridor, the location shown is conceptual. It will be reviewed for possible consideration as an alternative during this route planning study.)



BROCHURE NO. 2
DEVELOPMENT OF ALTERNATIVES

PUBLIC INFORMATION CENTRES

The Public Information Centres will present to the public the results of the initial data gathering phase and the preliminary alternative routes. The Consultants and Ministry staff will be in attendance to discuss the project and to receive your comments. Each centre will be open from 3:00 p.m. to 9:00 p.m. at the following locations.

- | | |
|--------------------------------|--|
| <i>Tuesday, May 15, 1990</i> | <ul style="list-style-type: none"> Markham Village Community Centre Highway 48 at Highway 7, Town of Markham |
| <i>Wednesday, May 16, 1990</i> | <ul style="list-style-type: none"> General W. Sikorski Polish Veterans Hall 1551 Stevenson Road North, City of Oshawa |
| <i>Thursday, May 17, 1990</i> | <ul style="list-style-type: none"> Tyrone Community Centre Tyrone, Town of Newcastle |
| <i>Wednesday, May 23, 1990</i> | <ul style="list-style-type: none"> Luther Vipond Memorial Arena 67 Winchester Road, Brooklyn, Town of Whitby |
| <i>Thursday, May 24, 1990</i> | <ul style="list-style-type: none"> Kahn Auction Barns Brock Road North, Town of Pickering (between Rossland Rd. and Taunton Road) |

WHAT HAPPENS NEXT

Following the Public Information Centres, the alternative routes to be carried forward will be determined. The environmental and engineering aspects of these routes will be assessed in detail leading to a comparative evaluation and the selection of a preferred route. This process and the preferred route will be presented to the public at the next series of Information Centres planned for the end of this year. Comments or questions are welcome at any time. Contact one of the listed Project Team Members.

ENVIRONMENTAL ASSESSMENT

This study is subject to the full requirements of the Environmental Assessment Act. An Environmental Assessment Report will be submitted to the Ministry of the Environment on completion of the study. Information and comments regarding the study will be maintained as a public data base and will be kept on file for use during the study and unless otherwise requested, may be included in the study documentation which is made available for public review.

ADDITIONAL INFORMATION

MARKHAM/PICKERING/WHITBY SECTION	OSHAWA/NEWCASTLE SECTION
Contact: Mr. Ali Minchev, or Mr. Ian Upjohn FENCO Engineers Inc. Atria North - Phase II 2235 Sheppard Avenue East Willowdale, Ontario M2J 5A6 (416) 756-1333	Contact: Mr. Doug Coutts, or Mr. Ray Smith Parker Consultants Limited 1400 Rymal Road East Hamilton, Ontario L0R 1P0 (416) 385-3234

MINISTRY OF TRANSPORTATION

Mr. C.R. Lumley
Project Director
(416) 235-5481

Mr. P.J. Reynolds
Project Manager
(416) 235-5482

Ms. K. Harding
Environmental Coordinator
(416) 235-5547

The Ministry of Transportation, Central Region, 3rd Floor, Atrium Tower, 1201 Wilson Avenue, Downsview, Ontario, M3M 1J8



Ministry of
Transportation

Ontario

Hwy. 407

Route Planning and
Environmental Assessment
Study

Hwy. 48 to
Hwy. 35/115



Brochure No. 2

Notice of Public
Information Centres
Alternative Routes
May, 1990

W.P. 282-86-01

and

W.P. 326-88-01

INTRODUCTION

The Ministry of Transportation is carrying out a study to determine the location and right-of-way requirements for proposed Highway 407 from Highway 48 in Markham easterly to Highway 35/115 in the Town of Newcastle (approximately 60 km). As proposed, Highway 407 will be an ultimate 10 lane freeway from Highway 48 easterly to the vicinity of Durham Road 34, (Courtice Road), in the Town of Newcastle. The remaining section to Highway 35/115 will be planned as an 8 lane freeway. A transit right-of-way will also be planned as part of the Highway 48 to Durham Road 34 section.

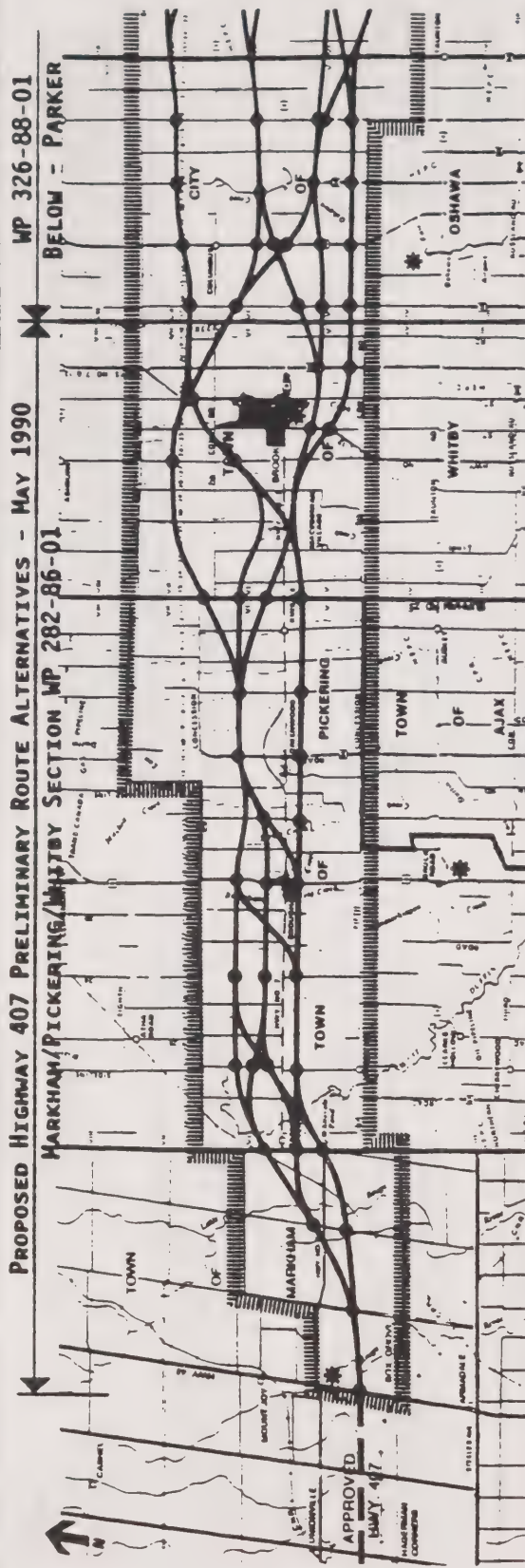
This is the second of a series of brochures advising the public of the study's progress. It is also an invitation to attend the first set of Public Information Centres to be held in May, 1990.

STUDY PROGRESS

The initial data gathering phase of the study has been completed. Based on an assessment of this environmental and engineering data, discussions with other government agencies and local municipalities and information received from the public, preliminary alternative routes have been developed. The routes are shown on the inside of this brochure. These routes will now be presented to the public for review and comment prior to selecting those to be carried forward for further consideration.

FENCO ENGINEERS INC.

WP 282-86-01



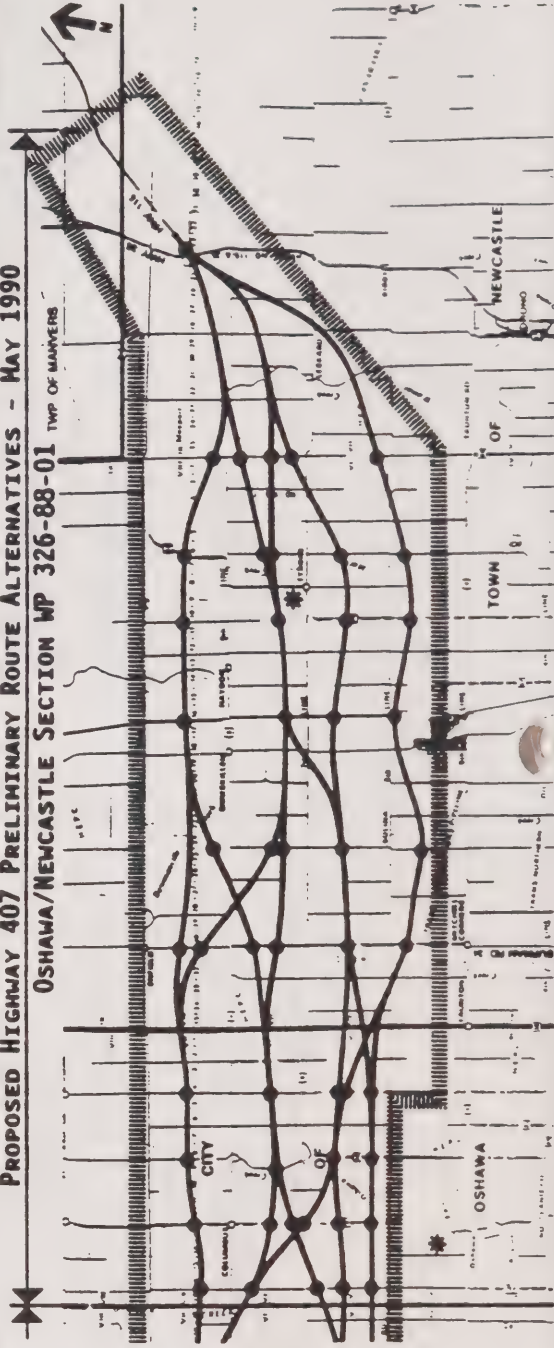
WP 326-88-01
BELOW - PARKER

LEGEND

- INFORMATION CENTRE LOCATIONS
- ALTERNATIVE ROUTES
- POSSIBLE INTERCHANGES
- STUDY AREA



PROPOSED HIGHWAY 407 PRELIMINARY ROUTE ALTERNATIVES - MAY 1990 OSHAWA/NEWCASTLE SECTION WP 326-88-01 TWP OF MAPERS



PARKER CONSULTANTS LTD.
WP 326-88-01

APPENDIX 2
NEWSPAPER ADVERTISEMENTS

STUDY INITIATION NOTICE

NEWSPAPER ADVERTISEMENT PLACEMENT

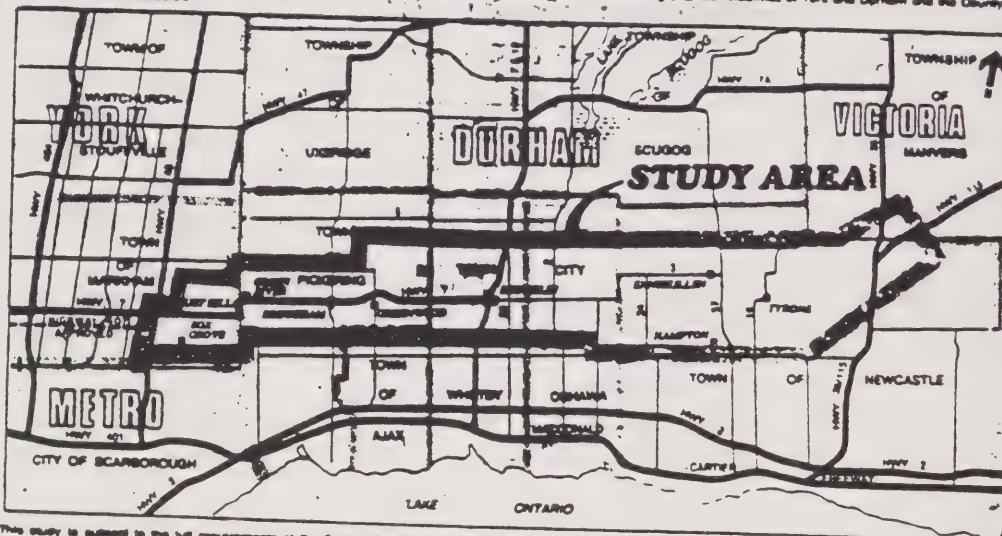
Ajax/Pickering	Ajax-Pickering News Advertiser	Wed. November 29/89
Bowmanville	Bowmanville Canadian Statesman	Wed. November 29/89
Markham	Markham Economist Sun	Wed. November 29/89
Newcastle	Newcastle (Millbrook) Independent	Wed. November 29/89
Orono	Orono Weekly Times	Wed. November 29/89
Oshawa	Oshawa Times	Sat. December 2/89
Peterborough	Peterborough Examiner	Sat. December 2/89
Pickering	The Bay News	Wed. November 29/89
Pickering	Pickering Post	Wed. November 29/89
Scarborough	Scarborough Mirror	Wed. November 29/89
Scarborough	Scarborough News	Wed. November 29/89
Toronto	Toronto Star	Sat. December 2/89
Toronto	Toronto Sun	Sun. December 3/89
Toronto	Globe and Mail	Sat. December 2/89
Whitby	Whitby Free Press	Wed. November 29/89

ONTARIO GOVERNMENT NOTICE

NOTICE OF ROUTE PLANNING AND ENVIRONMENTAL ASSESSMENT STUDY HIGHWAY 407 FROM HIGHWAY 48 TO HIGHWAY 35/115

The Ministry of Transportation of Ontario (MTO) has initiated a study to determine the location and right-of-way requirements for proposed Highway 407 from Highway 48 in Markham (vicinity to Highway 35/115 in the Town of Markham (approximately 60 km). As proposed Highway 407 will be an urban 10 lane freeway from Highway 48 easterly to the vicinity of Durham Road 34 (Courtice Road), in the Town of Markham. The remaining section to Highway 35/115 will be planned as an 8 lane freeway. A transit right-of-way will also be planned as part of the Highway 48 to Durham Road 34 section.

The initial phase of the study — DATA COLLECTION — is currently underway. Information on all engineering and environmental aspects of the study area will be collected and assessed to facilitate the development and analysis of alternative routes. A series of Public Information Centres will be held during this study. The first is currently planned for the Spring of 1980 at which time the results of data collection and the preliminary alternative routes will be presented for public review and comment. The full study area within which alternative routes will be developed includes portions of the Regional Municipality of York and Durham and the County of Victoria and is outlined below.



This study is subject to the full requirements of the Ontario Environmental Assessment Act. Approval will be requested to design and construct a corridor and to purchase property for the freeway and the transit right-of-way and for design, construction and operation of the freeway in the future. Comments and information regarding this study are being collected to assist MTO in meeting requirements of the Environmental Assessment Act. Information will be maintained as a public data base and will be kept on file for use during the study, and unless otherwise requested, will be included in study documentation which is made available for public review.

For further information contact:

CONSULTANT —
Hwy. 48 to Whitby/Oshawa
Boundary Section:

Mr. A. Munshaw, or
Mr. L. Upshaw
PERSCO Engineers Inc.
Atrio North — Phase II
2236 Sheppard Ave. East
Whitby, Ontario
M1B 5A8

(416) 796-1333

CONSULTANT —
Whitby/Oshawa to
Hwy 35/115 Section:

Mr. D. Coulls, or
Mr. R. Smith
C.C. PARKER
Consultants Ltd.
1489 Rymal Rd. East
Hamilton, Ontario
L8R 1P9

(416) 385-3254

MTO — HIGHWAY 407
Project Manager
Hwy. 48 to Hwy. 35/115:

Mr. P. Reynolds
Senior Transportation
Planner, MTO
Central Region
Atrium Tower, 3rd Floor
1201 Wilson Avenue
Downsview, Ontario
M3B 1J8

(416) 236-5482

MTO — HIGHWAY 407
Environmental Co-ordinator
Hwy. 48 to Hwy. 35/115:

Mr. A. J. Mulvihill
Senior Environmental
Planner, MTO
Central Region
Atrium Tower, 3rd Floor
1201 Wilson Avenue
Downsview, Ontario
M3B 1J8

(416) 236-5446



Ministry
of
Transportation

Ontario

PUBLIC INFORMATION CENTRE NOTICE

NEWSPAPER ADVERTISEMENT PLACEMENT

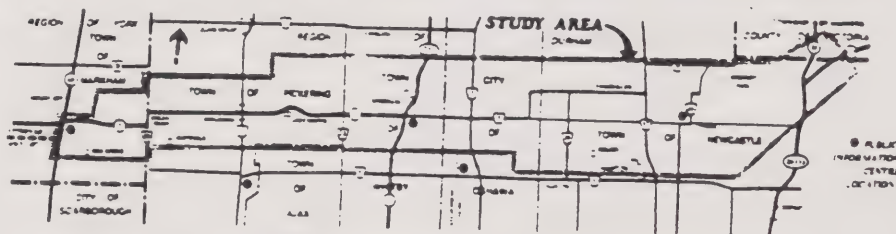
Ajax/Pickering	Ajax-Pickering News Advertiser	Wed. May 2/90
Bowmanville	Bowmanville Canadian Statesman	Wed. May 2/90
Markham	Markham Economist/Stouffville Tribune	Wed. May 2/90
Newcastle	Newcastle (Millbrook) Independent	Wed. May 2/90
Orono	Orono Weekly Times	Wed. May 2/90
Oshawa	Oshawa Times	Sat. May 5/90
Peterborough	Peterborough Examiner	Sat. May 5/90
Pickering	The Bay News	Wed. May 2/90
Pickering	Pickering Post	Wed. May 2/90
Scarborough	Scarborough Mirror	Wed. May 2/90
Scarborough	Scarborough News	Wed. May 2/90
Toronto	Toronto Star	Sat. May 5/90
Toronto	Toronto Sun	Sun. May 6/90
Toronto	Globe and Mail	Sat. May 5/90
Whitby	Whitby Free Press	Wed. May 2/90

ONTARIO GOVERNMENT NOTICE

NOTICE OF PUBLIC INFORMATION CENTRES — HIGHWAY 407 ROUTE PLANNING AND ENVIRONMENTAL ASSESSMENT STUDY FROM HIGHWAY 48 TO HIGHWAY 35/115.

The Ministry of Transportation of Ontario is carrying out a study to determine the location and right-of-way requirements for proposed Highway 407 from Highway 48 in Markham easterly to Highway 35/115 in the Town of Newcastle (approximately 60 km). As proposed, Highway 407 will be an ultimate 10 lane freeway from Highway 48 easterly to the vicinity of Durham Road 34 (Courtice Road), in the Town of Newcastle. The remaining section to Highway 35/115 will be planned as an 8 lane freeway. A transit right-of-way will also be planned as part of the Highway 48 to Durham Road 34 section.

The initial data gathering phase of the study has been completed. The second phase — GENERATION AND ANALYSIS OF ALTERNATIVE ROUTES is underway. Preliminary Alternative routes have been developed within the study area outlined below.



Information Centres have been arranged to present to the public results of the initial data gathering phase and the preliminary alternative routes. The consultants and Ministry staff will be in attendance to discuss the project and receive your comments.

The Public Information Centres will be held from 3:00 p.m. to 9:00 p.m. at the following locations:

- Tuesday May 15, 1990 — MARKHAM VILLAGE COMMUNITY CENTRE — Corner of Highway 48 and Highway 7, Markham.
- Wednesday May 16, 1990 — GENERAL W. SIKORSKI POLISH VETERANS HALL — 1551 Stevenson Rd. North, Oshawa.
- Thursday May 17, 1990 — TYRONE COMMUNITY CENTRE — Tyrone, Town of Newcastle.
- Wednesday May 23, 1990 — LUTHER VIVOND MEMORIAL ARENA — 67 Winchester Road, Brooklin, Town of Whitby.
- Thursday May 24, 1990 — KAHN AUCTION BARN — Brook Road North, Pickering, (between Highway 2 and Taunton Road).

This study is subject to the full requirements of the Ontario Environmental Assessment Act. Approvals will be requested to designate and protect a corridor and to purchase for the freeway and the transit rights-of-way and for design, construction and operation of the freeway in the future. Comments and information regarding this study are being collected to assist the Ministry in meeting requirements of the Environmental Assessment Act. Information will be maintained as a public data base and will be kept on file for use during the study and unless otherwise requested may be included in study documentation which is made available for public review.

For further information contact

MARKHAM PICKERING WHITBY SECTION

Fenco Engineers Inc. Attn: North — Phase II
2235 Sheppard Avenue East, Willowdale, Ontario M2J 5A6
Mr. A. Minchew or Mr. I. Upjohn (416) 756-1333

OR

OSHAWA NEWCASTLE SECTION

Parker Consultants Ltd., 1400 Rymal Road East, Hamilton
Ontario L8R 1P0

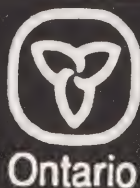
Mr. D. Coutts or Mr. R. Smith (416) 385-3234

The Ministry of Transportation, Transportation Planning Section, Central Region, 3rd Floor Atrium Tower, 1201 Wilson Avenue, Downsview, Ontario M3M 1J8.

Mr. C.R. Lumley
Project Director
(416) 235-5481

Mr. P.J. Reynolds
Project Manager
(416) 235-5482

Ms. K. Harding
Environmental Co-ordinator
(416) 235-5547



Ministry
of
Transportation

APPENDIX 3
SPECIAL INTEREST GROUPS
INVITEE LIST

1 INTEREST GROUP INVITEES TO PIC PREVIEW SESSIONS

ADDRESS LIST

	Full Name	Address and Other Information
Allin	Neil Allin	Durham Region Federation of Agriculture, R.R. #1, Orono, Ontario, L0B 1M0
Allin	Bob Allin	Durham Region Field Naturalists, P.O. Box 354, Oshawa, Ontario, L1H 7L3
Bowes	John Bowes	Greater Peterborough Economic Council, P.O. Box 2409, Peterborough, Ontario, K9J 7Y8
Brook	Greg Brook, Vice-Chairperson	C-PAC (Comm. for the Pickering Airport), Box 85, Brougham, Ontario, L0T 1A0
Burg	Brian Vanden Burg	Christian Farmers' Federation, R.R. #3, Newcastle, Ontario, L0A 1H0
* Central Ontario Regional Snowmobile Assoc.	Mrs. Gwen Luke, Acting Secretary	Central Ontario Regional, Snowmobile Association, c/o Box 388, Port Perry, Ontario, L9L 1A4
Collins	Bill Collins	Ontario Federation of Agriculture, R.R. #2, Whitby, Ontario, L1N 5R5
Cook	Robert P. Cook, Executive Director	Aggregate Producers Assoc. of Ontario, 325 Eddystone Avenue, Downsview, Ontario, M3N 1H8
Drake	Don Drake	Ontario Federation of Agriculture, R.R. #1, Locust Hill, Ontario, L0H 1J0
Durham Region Field Naturalists	Mr. Hugh Peacock	49 Stone St., Oshawa, Ontario, L1J 1A4
Federation of Agriculture, Durham Region	Durham Region Federation of Agriculture	R.R. #1, Orono, Ontario, , Attn: Shelley Allin, Secretary
Green River Residents Association	Green River Residents Association	#20, Hwy #7, R.R. #1, Locust Hill, Ontario, L0H 1J0
Hoy	Dale Hoy	Pickering Naturlists, P.O. Box 304, Pickering, Ontario, L1V 2R6
Joiner	Philip Joiner	Toronto Field Naturalists, 186 Thistledown Boulevard, Etobicoke, Ontario, M9V 1K1

ADDRESS LIST

	Full Name	Address and Other Information
	Long Sault Ridge Runners Snowmobile Club Inc.	Ms. Elaine Dittrick, Secretary Snowmobile Club Inc., P.O. Box 128, Bowmanville, Ontario, L1C 3K9
* Mack	L. Mack	R.R. #2, Preserve Agricultural Pickering, Claremont, Ontario, LOA 1E0
Martin	George Martin	Greenwood and Area Ratepayers Assoc., Greenwood Post Office, Greenwood, Ontario, LOH 1H0
Millson	Jim Millson	Ontario Federation of Agriculture, R.R. #1, Enniskillen, Ontario, LOB 1H0
Nemish	R.E. Nemish, President	The Claremont and Dist. Community Assoc., 1763 Central Street, P.O. Box 280, Claremont, Ontario, LOH 1E0
Noble	John Noble	Ontario Federation of Agriculture, R.R. #2, Uxbridge, Ontario, LOC 1K0
Pickering Rural Association	Pickering Rural Association	c/o Mr Chris Whillanf, 4935 Westney Road, Claremont, Ontario, LOH 1E0
Robb	Jim Robb	Save The Rouge Valley System, 280 Manse Road, Room 11, West Hill, Ontario, M1E 3V4
* SRVS	Mr. Stephen Marshall	SRVS, Locust Hill, Ontario, LOH 1J0
Whitevale & District Residents Association	Mr. Lloyd Thomas, President	Whitevale & District, Residents Association, P.O. Box 28, Whitevale, Ontario, LOH 1M0
Wilson	G. Wilson	Friends of Whitevale, P.O. Box 10, Whitevale, Ontario, LOH 1M0

* Attended Interest Group preview session



Ontario

Ministry
of
Transportation

ministère
des
Transports

(416) 235-5482

Transportation Planning Office
3rd Floor, Atrium Tower
1201 Wilson Avenue
Downsview, Ontario
M3M 1J8

April 20, 1990

RE: Highway 407 Route Planning, Preliminary
Design and Environmental Assessment Study
From Highway 48 to Highway 35/115
W.P. 282-86-01 and W.P. 326-88-01

The Ministry of Transportation is carrying out a study to determine the location and right-of-way requirements for proposed Highway 407 from Highway 48 in Markham easterly to Highway 35/115 in the Town of Newcastle (approximately 60 km). As proposed, Highway 407 will be an ultimate 10-lane freeway from Highway 48 easterly to the vicinity of Durham Road 34 (Courtice Road) in the Town of Newcastle. The remaining section to Highway 35/115 will be planned as an 8-lane freeway. A transit right-of-way will also be planned as part of the Highway 48 to Durham Road 34 section.

The initial data gathering phase of the study has been completed. Based on an assessment of this environmental and engineering information, discussions with other government agencies and local municipalities and information received from the public, preliminary alternative routes have been developed. These routes will now be presented to all study participants and the public for review and comment prior to selecting those to be carried forward for further consideration.

Public Information Centres have been arranged for the following dates and locations. All centres will be open to the public from 3:00 p.m. to 9:00 p.m.

Tuesday May 15, 1990

Markham Village Community Centre
Highway 48 at Highway 7, Markham

Wednesday May 16, 1990

General W. Sikorski Polish Veterans Hall
1551 Stevenson Road North, Oshawa

Thursday May 17, 1990

Tyrone Community Centre, Tyrone

Wednesday May 23, 1990

Luther Vipond Memorial Arena
67 Winchester Road, Brooklin

Thursday May 24, 1990

Kahn Auction Barns
Brock Road North, Pickering
(between Rossland Road and Taunton Road)

Interest Group Sessions:

To date many public interest groups have provided information and suggestions regarding the Highway 407 Route Planning Study.

To provide these and other interest groups an opportunity to discuss their specific areas of interest, the consultants and Ministry staff will be available at Interest Group Sessions from 1:00 p.m. to 3:00 p.m. immediately prior to the regular information centre period.

Your group is invited to attend any of these sessions at the locations previously indicated.

We would appreciate your comments at the information centre and request that follow-up comments or requests for additional discussions regarding this phase of the study be forwarded by June 15, 1990.

Following this series of information sessions, the alternative routes to be carried forward will be determined. The environmental and engineering aspects of these routes will be assessed in detail leading to a comparative evaluation and the selection of a preferred route.

Please note that information and comments regarding the study will be maintained as a public data base and will be kept on file for use during the study and, unless otherwise requested, may be included in the study documentation which is made available for public review.

If you require additional information regarding the information centres or the project in general, please contact one of the project team members listed below.

Markham/Pickering/Whitby Section:

Mr. A.T. Minchev, or Mr. I.K. Upjohn
Fenco Engineers Inc.
Atria North - Phase II
2235 Sheppard Avenue East
Willowdale, Ontario
M2J 5A6
Telephone: (416) 756-1333

Oshawa/Newcastle Section:

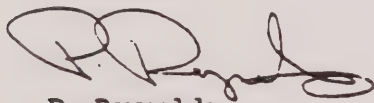
Mr. D. Coutts, or Mr. R. Smith
Parker Consultants Limited
1400 Rymal Road East
Hamilton, Ontario
L0R 1P0
Telephone: (416) 385-3234

Ministry of Transportation:

Mr. P. Reynolds
Project Manager (Highway 407 from Highway 48 to 35/115)
Transportation Planning Section
3rd Floor, Atrium Tower
1201 Wilson Avenue
Downsview, Ontario
M3M 1J8
Telephone: (416) 235-5482

Ms. K. Harding
Environmental Coordinator
Planning and Design
5th Floor, Atrium Tower
1201 Wilson Avenue
Downsview, Ontario
M3M 1J8
Telephone: (416) 235-5547

Sincerely



P. Reynolds
Senior Transportation Planner

PR/gsw

53425

cc: D. Garner	MTO
C. Lumley	MTO
K. Harding	MTO
A. Minchev	Fenco Engineers Inc.
I. Upjohn	Fenco Engineers Inc.
D. Coutts	C.C. Parker
R. Smith	C.C. Parker
P. Prier	Ecological Services for Planning

APPENDIX 4
SAMPLE
ATTENDANCE SHEET
AND
COMMENT SHEET

HIGHWAY 407

ROUTE PLANNING AND ENVIRONMENTAL ASSESSMENT STUDY

HIGHWAY 48 - HIGHWAY 35/115

W.P. 282-86-01 & W.P. 326-88-01

ATTENDANCE SHEET

INTEREST GROUP SESSION

NAME

INTEREST GROUP AFFILIATION

Date _____



Ontario

Route Planning and Environmental Assessment Study

Attendance Sheet

Name

Postal Code

[illegible]

Date: _____

Ministry of
Transportation

HIGHWAY 407
Highway 48 to Highway 35 / 115

Route Planning and Environmental Assessment Study

PUBLIC INFORMATION CENTRE SERIES #1 - May 15, 16, 17, 23, 24, 1990

Comment Sheet

(Please Print)

Name: _____

Mailing Address: _____

Telephone Number: _____

Property Location and Registered Owner (if different from above): _____

Comments: _____

This study is subject to the full requirements of the Environmental Assessment Act. An Environmental Assessment Report will be submitted to the Ministry of the Environment on completion of the study. Information and comments regarding the study will be maintained as a public data base and will be kept on file for use during the study and, unless otherwise requested, may be included in the study documentation which is made available for public review.

Either drop in box provided or mail to: Ontario Ministry of Transportation
Transportation Planning Section
Central Region
Atrium Tower, 3rd Floor
1201 Wilson Avenue
Downsview, Ontario
M3M 1J8

Thank you for your participation

**PUBLIC INVOLVEMENT
RESULTS OF PUBLIC INFORMATION CENTRES
ROUTE PLANNING PHASE
JUNE 18, 20, 25, 26, 27, 1991**

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- 5.0 ATTENDANCE AND SUMMARY OF COMMENTS RECEIVED
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 - 5.2 Comments
- 6.0 ACTION BY PROJECT TEAM

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1.0 INTRODUCTION

As an integral part of obtaining study participants' input in the Route Selection phase of the Highway 407/Transit Transportation Corridor Route Planning and Environmental Assessment Study, a series of five (5) Public Information centres were held at the following venues:

Tuesday June 18, 1991

Markham Village Community Centre

Highway 48 at Highway 7

Town of Markham

Thursday June 20, 1991

Tyrone Community Centre

Tyrone, Town of Newcastle

Tuesday June 25, 1991

Luther Vipond Memorial Arena

67 Winchester Road, Brooklin

Town of Whitby

Wednesday, June 26, 1991

General W. Sikorski Polish Veterans Hall

1551 Stevenson Road North

City of Oshawa

Thursday June 27, 1991

Kahn Auction Barns

Brock Road North

Town of Pickering

Each centre was open to the general public between 3:00 p.m. and 9:00 p.m. Identified special interest groups were invited to attend separate sessions between 2:00 p.m. and 3:00 p.m. in conjunction with each information centre. Interest group invitees are listed in Appendix 3.

This report outlines the general procedures for public notification and the conduct of the information centres, and documents the results of the centres held in Markham, Pickering and Whitby. The results of the Oshawa and Newcastle (Tyrone) information centres have been documented under separate cover by Parker Consultants.

2.0 PURPOSE OF THE INFORMATION CENTRES

The purpose for conducting the information centres was to introduce the project and provide interested parties with the opportunity of reviewing and commenting on the technically preferred route and the summary analysis and evaluation process used to select the route.

3.0 PUBLIC NOTIFICATION OF THE INFORMATION CENTRES

Arrangements were made to notify the general public of the information centres. This included all resident and non-resident property owners and businesses within the study area. Two mechanisms were adopted to achieve this:

1. Mail (general distribution and direct mail)
2. Newspaper notices

3.1 Mail

Information brochures announcing the information centre were distributed to resident property owners and businesses on a household mail delivery basis. Postal stations serving the study area received a total of 22,600 brochures for general distribution. Study area coverage requirements were determined from written and verbal information received directly from local postal station managers during the Study Initiation notification phase of the study (November 1989) and updated during the Route Selection phase.

Approximately 540 non-resident property owners, as identified from municipal property assessment roles, received brochures via first class (direct) mail.

Other direct mailings (approximately 440) included those to the External Team, the Municipal Technical Team, Municipal Clerks, special interest groups, provincial and federal elected representatives and individuals who requested inclusion on the mailing list.

3.2 Newspaper

Notification appeared in 16 local and regional newspapers two weeks prior to the first information centre. Each of the affected local municipalities was covered, as were the primary geographical areas where non-resident property owners reside.

A sample of the Public Information Centre advertisements, a listing of the newspapers utilized and the dates on which the advertisements appeared are included in Appendix 2.

4.0 INFORMATION CENTRE FORMAT AND PROCEEDINGS

The public information sessions were conducted on a drop-in centre basis. Attendees were requested to register as they entered. A welcome was extended and attendees were invited to inspect the display material. Consultant and MTO staff (including Central Region Property Section representatives) were available for explanation and clarification, which generally proceeded on an individual basis as attendees reviewed the presentation material.

The following material was displayed:

- . Photo enlargement of notification brochure
- . Study organization and schedule
- . Study Area location in the context of the Greater Toronto Area and other freeway and transit network improvement proposals

- . Major growth nodes proposed in Region of Durham Official Plan (1991)
- . Study rationale, need and justification, organization and schedule
- . 1:10,000 scale aerial photomosaic showing existing conditions and Study Area limits, with the technically preferred route superimposed
- . 1:20,000 scale plan showing modifications to route alternatives since the last public information centre
- . Environmental Assessment Process flow diagram and text
- . 1:20,000 scale 401-407 Link Study alternatives
- . Data displays with route alternative overlays (on 1:10,000 scale property base plan), and technically preferred route highlighted
 - natural environment
 - agriculture
 - fisheries
 - vegetation
- . Consolidated constraint mapping with route alternative overlay (on 1:10,000 scale property base plan) and technically preferred route highlighted
- . Region of Durham Official Plan (June 1991) land use designations in the Brooklin and Columbus areas (1:10,000 scale)
- . Preliminary profiles (freeway/transit) for technically preferred route
- . Typical cross-section (freeway/transitway) and typical interchange configuration (near/far station schemes)

- . 1:20,000 scale plan showing bridge and culvert locations
- . Listing of factors and indicators used in analysis and evaluation of route alternatives, plus chart showing relative significance of factors used in the evaluation process
- . Summary of staged evaluation process
- . MTO stormwater management initiatives
- . Advance property acquisition criteria

Staff also established a "resource area" at each centre which was used as a work area and for one-on-one discussions with attendees. Other information on hand, but not displayed, included:

- . 1:4,000 photo mosaics with alternatives superimposed
- . Additional property ownership information
- . Environmental and engineering data assembly working drawings
- . Data collection technical working papers
- . Alternative route profiles
- . Traffic modelling road network
- . Municipal planning and development documents
- . Staged analysis and evaluation data sheets
- . Noise contours

This material was used extensively throughout the course of the five information centres.

Once participants had reviewed the proposals they were asked to complete a comment sheet, including mailing and property ownership addresses, to be left at the centre or mailed to the MTO Transportation Planning Section within two weeks (See Appendix 4 for sample Registration Sheet and Comment Sheet). Postage paid envelopes were provided for mailing comments.

5.0 ATTENDANCE AND SUMMARY OF COMMENTS RECEIVED

5.1 Attendance

Response to the information centres was considered extremely favourable in terms of attendance. A total of 456 registrants, representing 378 households and businesses, was recorded at the Markham, Pickering and Whitby centres. Table 1 provides a breakdown of total attendance by information centre venue and a geographical distribution of attendees.

Representation from the venue municipality was highest in Whitby (60.8%) and roughly equal at the other two centres (56.5% in Markham and 55.8% in Pickering).

Representation from the Oshawa-Newcastle section of the study area was highest at the Whitby venue (24%) and lowest at Markham (0%). Conversely, representation from Metropolitan Toronto was highest at Markham (27.1%) and lowest at Whitby (1.9%).

Attendees from other areas comprised approximately 3.7% of the total, with the Town of Ajax being the most heavily represented.

5.2 Comments

A total of 87 Comment Sheets have been received to date and they reflect the attendance levels generated at each of the three information centre venues in the West Section of the study area. About 32% of all comments were received at the Pickering venue, while those received at Whitby (24) and Markham (22) represented 27.6% and 25.3% of the total respectively. Four Comment Sheets were completed by West Section study area residents attending either the Oshawa or Newcastle information sessions. Table 2 provides a breakdown of Comment Sheet origin by municipality.

Thirty-two percent of all comments and concerns pertaining to the West Section study area emanated from Whitby residents, while comments from Pickering and Markham residents comprised 26.0% and 19.5% of the total respectively.

TABLE 1

BREAKDOWN OF INFORMATION CENTRE ATTENDANCE

<u>VENUE</u>	<u>DISTRIBUTION</u>									
	<u>Total</u> <u>Registrants</u>	<u>Markham</u>	<u>Pickering</u>	<u>Whitby</u>	<u>Oshawa</u>	<u>Newcastle</u>	<u>Metro</u>	<u>Other</u>	<u>No</u> <u>Address</u>	<u>Total</u>
Markham	102	52	3	5	-	-	24	8	-	92
Pickering	89	5	36	6	8	2	7	9	4	77
Whitby	265	5	5	127	48	2	4	9	9	209
TOTALS	456	62	44	138	56	4	35	26	13	378

Notes:

1. Total registrants include all those who signed the Attendance Sheets and likely represents 90 - 95% of all attendees.
2. Geographical distribution is generally indicative of the number of households or businesses represented from each municipality; therefore, totals do not correspond to total registrants.
3. Distribution of "Other" registrants include those who did not indicate on address (approximately 1.0% of all registrants).
4. Figures include attendance at more than one venue.

TABLE 2
BREAKDOWN OF COMMENT SHEET ORIGIN

VENUE

MUNICIPALITY BY ORIGIN

	<u>Total</u>	<u>Markham</u>	<u>Pickering</u>	<u>Whitby</u>	<u>Metro</u>	<u>Other</u>	<u>No Address</u>
Markham	21	14	0	0	4	3	0
Pickering	30	1	18	2	2	6	1
Whitby	23	0	2	19	2	0	-
Oshawa	4	0	0	4	0	0	-
Newcastle	0	0	0	0	0	0	0
TOTALS	77	15	20	25	8	9	1
(%)	(100)	(19.5)	(26.0)	(32.5)	(10.4)	(11.7)	(1.3)

Responses from Metro Toronto and elsewhere (primarily Ajax) comprised about 22% of the total and one respondent did not provide an address.

The following sections provide a summary of comments received by municipality, including an indication of route preferences and associated rationale. Brochure No. 3 in Appendix 1 shows the location of the route alternatives presented at the information centres.

5.2.1 Town of Markham

The most commonly expressed concern (5 of 15 comment sheets) was related to the protection of an interchange at Ninth Line. The majority of comments in this regard emanated from residents living in the Hamlet of Box Grove and on the west side of Ninth Line between the proposed route and Sixteenth Avenue. Opposition to the interchange was concerned that additional traffic on the Ninth Line will result in undesirable effects such as increased noise, reduced levels of safety and visual intrusion.

Essentially, there was agreement that the Markham Bypass should be the main north-south traffic artery in the area. However, there was a general sense that, with a Ninth Line interchange included in the road network, the interchanges at Highway 48, Ninth Line, the Markham Bypass and York Road 30 (Townline) would be too closely spaced. There was some suggestion that, if Ninth Line is needed as a 6-lane facility in the future, any widening should occur exclusively to the east or Ninth Line should be reconstructed to the east with a vegetative buffer between the new roadway and existing residences to the west.

No comments expressed explicit opposition to introducing Highway 407 in terms of providing additional transportation service in the area. However, one respondent indicated that rapid transit, exclusive of any freeway facility, might be a more appropriate modal option.

Two comments regarding the natural environment were recorded. The first was related to disturbance/loss of wildlife habitat in the Rouge River valley. The second expressed general concern over potential effects to the Seaton Valley Trail and the Duffin Creek headwaters.

There are a number of major land use and transportation initiatives being pursued in the southeast portion of the Town of Markham (e.g. new East Markham community; Highway 407/transit facility; Markham Bypass; Northeast Metro, Southeast York and West Durham Strategic Transportation Review.) It was suggested that there is a need for a high level of co-ordination amongst all participating levels of Government (Town of Markham, Region of York, Region of Durham, Metropolitan Toronto, City of Scarborough, Town of Pickering) in studying the implications of implementing all of the contemplated projects.

Although not part of this study, the possible future relocation of Highway 7 through the east end of Markham was the subject of comments from two respondents. Both suggested that there is a need to relocate the Highway 7 corridor so that it bypasses both Locust Hill and Green River.

Other comments from the Markham area included:

Expression of concern that any future relocation of Highway 7 to the north may diminish the value of adjacent properties, and inquiry as to whether compensation for demonstrated property value diminution would be considered. (As indicated above, consideration relative to possible major relocation of Highway 7 does not constitute part of this study).

Desire for further information on the status of the previously studied East Metro Freeway (EMF). (Matters pertaining to additional investigation of the former EMF corridor are also not part of this study).

The need to install traffic signals at Highway 7 and the Markham Bypass. (This matter is also considered to be outside the scope of this study in terms of investigating whether signalization is warranted).

General concern over increased levels of "pollution" associated with implementation of the Highway 407/transit project.

5.2.2 Town of Pickering

The majority of comments in the Town of Pickering were received from a group of residents located primarily in the west end of the Town in the area between Whitevale and Claremont. Comments were received from individual respondents who represent area groups such as the Whitevale and District Residents Association and the Pickering Rural Association. These associations have recently joined to form the Seaton Community Planning Group which is participating in the Province's public involvement program related to formulating a strategy for development of the Seaton Community.

The concerns and suggestions of this group are summarized as follows:

- . Need for further information related to the need and justification for the Highway 407/transit facility.
- . Suggestion that transit is the most appropriate mode for providing additional transportation service and that the existing CP Rail Havelock Subdivision corridor should be used for this purpose.
- . Concern over the loss of good agricultural land.
- . Potential intrusive effects to the historical community of Whitevale and Green River (noise, attraction of additional development/traffic).
- . Concern over the relative significance afforded the need to service the future Seaton Community.
- . Potential disruption to activities on the Heritage section of the Seaton Trail.
- . Potential for a possible interchange at North Road to attract additional traffic through the Hamlet of Whitevale.

There was also some suggestion from others that if funding is to be made available it should be channelled towards improving public transit and that transit should be afforded greater priority than highways.

There was a perception (by 2 respondents) that the technically preferred route may not be cost-effective due to the length involved in attempting to avoid various major constraints. A particular reference in this regard was cost of structures required for the two crossings of Highway 7.

There was concern expressed by one resident of Brougham over the apparent encroachment of the proposed interchange right-of-way at Brock Road on the southern end of the hamlet. It was suggested that the freeway/transit facility could be shifted south through this area to avoid such encroachment.

Two respondents suggested local lowering of the profile to reduce potential noise impacts.

There was concern expressed by the Seaton Valley Radio Controlled Model Corporation (i.e. Seaton Flying Club) over the potential of the proposed crossing of the West Duffin Creek valley to displace the club's flying site adjacent to the Seaton Trail. The club currently has a long term lease arrangement with the Province for this site and they indicated that there will be an appeal to the Province to relocate their facilities to another suitable site at government expense.

A representative of the Pickering Naturalist's Club suggested that an effort should be made to avoid any encroachment on the "heritage" woodlot on the century farm on the south half of Lot 8, Concession 6, Pickering. The owner of the property independently expressed the same sentiment.

Other comments received from the Town of Pickering area included:

- Desire for further information relative to the current position of provincial, regional, municipal government representatives on the technically preferred route.

Suggestion that an easterly Brock Road bypass of Brougham (as per Region of Durham Official Plan designation) would reduce the potential for drawing traffic through the hamlet, thus negating (in part) the rationale for a route south of Brougham.

Perception that location near the facility, especially in the vicinity of an interchange will increase attractiveness of the property to commercial investors or increase the potential for rezoning to higher and better land use, resulting in increased property value.

5.2.3 Town of Whitby

No contentious area wide planning issues emerged from the comments received in the Town of Whitby. Five respondents expressed strong support for the technically preferred route.

In general, respondents who opposed the preferred route were most concerned with individual property impacts. Comments in this vein were essentially characterized by three main areas of concern:

- . Direct loss of property including outright displacement and the resultant need to relocate.
- . Perceived loss of enjoyment in the use of residential properties adjacent to the facility and resultant desire to relocate.
- . Perceived diminution of property value for residential properties adjacent to the facility; need for financial compensation.

Most of the concerns in these categories were expressed by residents in the strip of 10 acre lots on Country Lane Road. Some of these respondents also expressed the following concerns relative to a southerly bypass of Brooklin (viz. a northern bypass).

Creating a physical barrier between Brooklin and the Whitby urban area is undesirable (impacts to both communities) and unnecessary.

The proposed facility would attract industrial-commercial land uses to areas currently occupied by residential uses rather than to peripheral urban areas where they should desirably be located.

Potential for adverse impacts to wildlife and fish spawning grounds just north of Heber Down Conservation Area (Environmentally Significant Area identified by Central Lake Ontario Conservation Authority).

Perceived low degree of cost-effectiveness associated with additional length to avoid major constraints (i.e. two structures over Highway 7, crossroad grade separations).

Perceived vibration effects on buildings within 0.5 miles of Highway 407.

Four respondents expressed concerns relative to the potential for increased traffic through the Village of Brooklin. In this regard, one recommended that the proposed interchange at Highway 12 be deleted.

Other comments received from the Town of Whitby included:

An indication that Highway 407 is required but should be located further north

The freeway/transit facility will encourage urban sprawl in the GTA to the detriment of the modal concept of development

General concerns relative to lack of available funding and the potential for increases in "pollution"

6.0

ACTION BY PROJECT TEAM

All written comments were replied to in kind by either MTO or consultant staff, including an indication as to the sequence of events leading to the next opportunity for formal public involvement. Those with specific questions or requests for further information were provided with individual responses.

The Municipal Technical Team will receive copies of this technical paper for information purposes. Municipal Councils will also receive a copy of this technical paper through their respective clerks.

The Project Team will determine appropriate action for completion of activities within the Route Selection phase of the study based on a review of all comments received from municipalities, other provincial agencies, interest groups and the public. This will include a review of the technically preferred route, need for alignment modifications or additional investigations prior to making a final recommendation on the route location.

APPENDIX 1

BROCHURE NO. 3

PRESENTATION OF TECHNICALLY PREFERRED ROUTE



Ontario

Ministry of
Transportation

Hwy. 407 / Transit

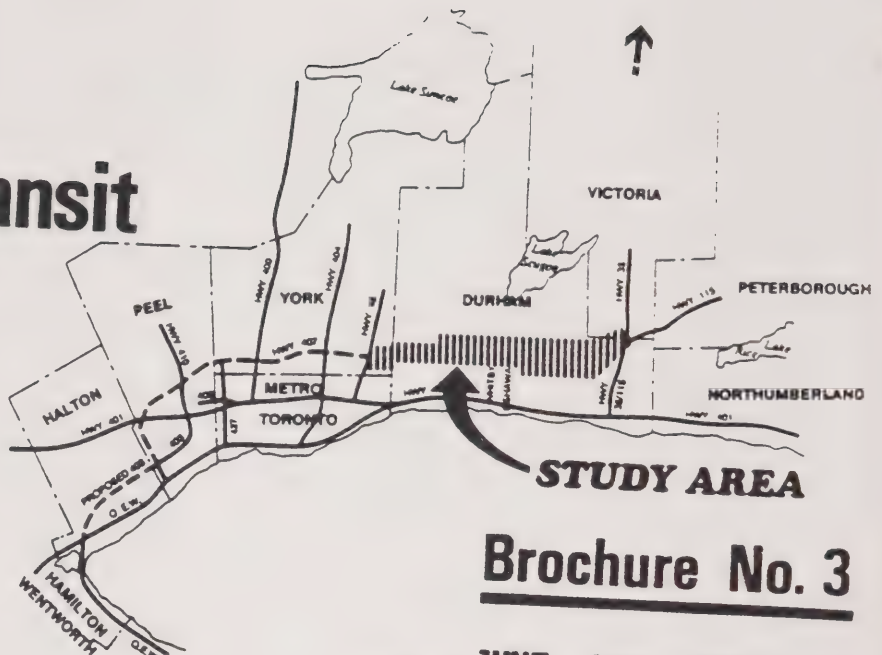
Transportation Corridor
Route Planning and
Environmental
Assessment Study

Hwy. 48 to
Hwy. 35/115

W.P. 282-86-01

and

W.P. 326-88-01



Brochure No. 3

JUNE, 1991 NOTICE OF
PUBLIC INFORMATION CENTRES
PRESENTATION OF A TECHNICALLY
PREFERRED ROUTE

INTRODUCTION

The Ministry of Transportation is carrying out a study to determine the location and right-of-way requirements for the proposed Highway 407/Transit facility from Highway 48 in Markham easterly to Highway 35/115 in the Town of Newcastle (approximately 60 km). As proposed, Highway 407 will be an ultimate 10 lane freeway from Highway 48 easterly to the vicinity of Durham Road 34 (Courtice Road) in the Town of Newcastle. The remaining section to Highway 35/115 will be planned as an 8 lane freeway. The transit right-of-way will be planned from Highway 48 to approximately Durham Road 34.

This is the third of a series of brochures advising the public of the study's progress. It is also an invitation to attend, in June, 1991, the second set of Public Information Centres to be held for this study.

STUDY PROGRESS

The Ministry has selected a technically preferred route based on assessments and comparisons of environmental and engineering data, discussions with other government agencies and local municipalities and information received from the public. The selected route and the alternatives considered are shown on the inside of this brochure. The proposed route will now be presented to the other agencies, the municipalities and the public for review and comment.

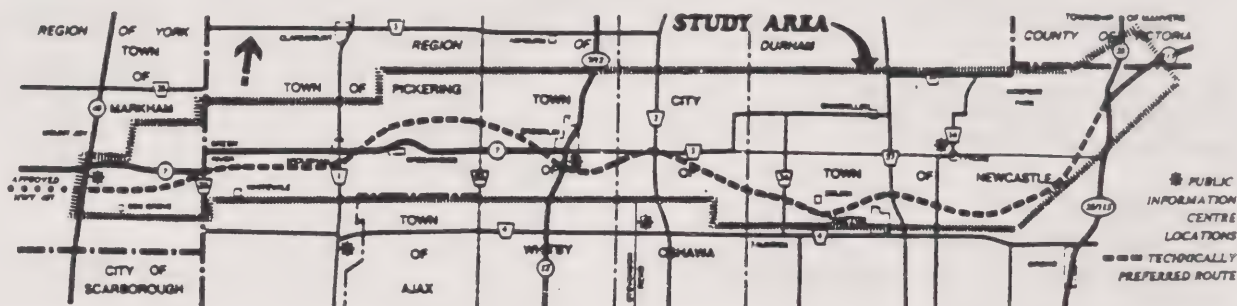
APPENDIX 2
NEWSPAPER ADVERTISEMENTS

ONTARIO GOVERNMENT NOTICE

NOTICE OF PUBLIC INFORMATION CENTRES — HIGHWAY 407/TRANSIT TRANSPORT CORRIDOR ROUTE PLANNING AND ENVIRONMENTAL ASSESSMENT STUDY FROM HIGHWAY 48 TO HIGHWAY 35/115

The Ministry of Transportation of Ontario is carrying out a study to determine the location and right-of-way requirements for the proposed Highway 407/Transit facility from Highway 48 in Markham easterly to Highway 35/115 in the Town of Newcastle (approximately 60 km). As proposed, Highway 407 will be an ultimate 10-lane freeway from Highway 48 easterly to the vicinity of Durham Road 34 (Courtice Road), in the Town of Newcastle. The remaining section to Highway 35/115 will be planned as an 8-lane freeway. The transit right-of-way will be planned from Highway 48 to approximately Durham Road 34.

A TECHNICALLY PREFERRED ROUTE has been selected for presentation based on assessments of environmental and engineering data, discussions with other government agencies and local municipalities and information received from the public.



Information Centres have been arranged to present the route to the public for review and comment.

The Public Information Centres will be held from 3:00 p.m. to 9:00 p.m. at the following locations:

- Tuesday, June 18, 1991 — MARKHAM VILLAGE COMMUNITY CENTRE — Corner of Highway 48 and Highway 7, Markham;
- Thursday, June 20, 1991 — TYRONE COMMUNITY CENTRE — Tyrone, Town of Newcastle;
- Tuesday, June 25, 1991 — LUTHER VIPOND MEMORIAL ARENA — 67 Winchester Road, Brooklin, Town of Whitby;
- Wednesday, June 26, 1991 — GENERAL W. SIKORSKI POLISH VETERANS HALL — 1551 Stevenson Rd. North, Oshawa;
- Thursday, June 27, 1991 — KAHN AUCTION BARN — Brock Road North, Pickering (between Highway 2 and Taunton Road).

This study is subject to the full requirements of the Ontario Environmental Assessment Act. Approval will be requested to designate and protect a corridor and to purchase property for the freeway and the transit rights-of-way and for design, construction and operation of the freeway in the future. Comments and information regarding this study are being collected to assist the Ministry in meeting requirements of the Environmental Assessment Act. Information will be maintained as a public data base and will be kept on file for use during the study and, unless otherwise requested, may be included in study documentation which is made available for public review.

For further information contact:

MARKHAM/PICKERING/WHITBY SECTION

Fenco Engineers Inc., Atria North - Phase II
2235 Sheppard Ave. E., Willowdale, Ontario M2J 5A6
Mr. A. Minchev, or Mr. I Upjohn (416) 756-1333

OR

OSHAWA/NEWCASTLE SECTION

Parker Consultants Ltd., 1400 Rymal Road East
Hamilton, Ontario L0R 1P0
Mr. D. Courts, or Mr. R. Smith (416) 385-3234

The Ministry of Transportation, Transportation Planning Section, Central Region, 3rd Floor Atrium Tower, 1201 Wilson Avenue, Downsview, Ontario, M3M 1J8

Mr. C.R. Lumley
Project Director
(416) 235-5481

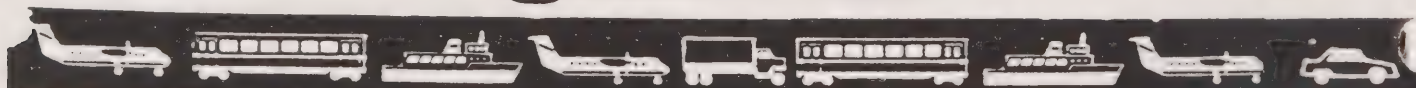
Mr. P.J. Reynolds
Project Manager
(416) 235-5482

Ms. K. Harding
Environmental Co-ordinator
(416) 235-5547



Ministry
of
Transportation

Ministère
des
Transports



PUBLIC INFORMATION CENTRE NOTICE
NEWSPAPER ADVERTISEMENT PLACEMENT

Ajax/Pickering	Ajax-Pickering News Advertiser	Wed. June 12/91
Bowmanville	Bowmanville Canadian Statesman	Wed. June 12/91
Markham	Markham Economist/Stouffville Tribune	Wed. June 12/91
Newcastle	Newcastle (Millbrook) Independent	Wed. June 12/91
Orono	Orono Weekly Times	Wed. June 12/91
Oshawa	Oshawa Times	Sat. June 8/91
Oshawa/Whitby	Oshawa/Whitby This Week	Wed. June 12/91
Peterborough	Peterborough Examiner	Sat. June 8/91
Pickering	The Bay News	Wed. June 12/91
Pickering	Pickering Post	Wed. June 12/91
Scarborough	Scarborough Mirror	Wed. June 12/91
Scarborough	Scarborough News	Wed. June 12/91
Toronto	Toronto Star	Sat. June 8/91
Toronto	Toronto Sun	Sun. June 9/91
Toronto	Globe and Mail	Sat. June 8/91
Whitby	Whitby Free Press	Wed. June 12/91

APPENDIX 3
SPECIAL INTEREST GROUPS
INVITEE LIST

INVITEES TO JUNE 1991
PUBLIC INTEREST GROUP INFORMATION SESSIONS

Mr. Bob Allin
Durham Region Field Naturalists
P.O. Box 354
Oshawa, Ontario
L1H 7L3

Mr. Greg Brook
C-PAC (Committee for the Pickering
Airport Community)
Box 85
Brougham, Ontario
L0H 1A0

Mr. Brian Vander Burg
Christian Farmers' Association
R.R. #3
Newcastle, Ontario
L0A 1H0

Mr. Bill Collins
Ontario Federation of Agriculture
R.R. #2
Whitby, Ontario
L1N 5R5

Ms. Pam Callus
Courtice & Area Community Association
Box 253
Bowmanville, Ontario
L1C 3L1

Durham Environmental Network
540 Rougemount Drive
Pickering, Ontario
L1W 2C2

Mr. Philip Joiner
Toronto Field Naturalists
186 Thistledown Boulevard
Etobicoke, Ontario
M9V 1K1

Mr. John Bowes
Greater Peterborough Economic Council
P.O. Box 2409
Peterborough, Ontario
K9J 7Y8

Mr. William A. Brown
Salem Cemetery Board
R.R. #1
Locust Hill, Ontario
L0H 1J0

Mrs. Gwen Luke
Central Ontario Regional Snowmobile
Association
Box 388
Port Perry, Ontario
L9L 1A4

Mr. Robert P. Cook
Aggregate Producers Assoc. of Ontario
325 Eddystone Avenue
Downsview, Ontario
M3N 1H8

Mr. Don Drake
Ontario Federation of Agriculture
R.R. #1
Locust Hill, Ontario
L0H 1J0

Green River Residents Association
#20 Highway 7, R.R. #1
Locust Hill, Ontario
L0H 1J0

Mr. Bruce King, Project Manager
Rouge Valley Park Advisory Committee
c/o Ministry of Natural Resources
50 Bloomington Road West
R.R. #2, Aurora, Ontario
L4G 3G8

Mr. L. Mack
Preserve Agriculture Pickering
R.R. #2
Claremont, Ontario
L0H 1E0

Ms. Elaine Dittrick
Long Sault Ridge Runners
Snowmobile Club Inc.
P.O. Box 128
Bowmanville, Ontario
L1C 3K9

Mr. George Martin
Greenwood Ratepayers' Association
Greenwood P.O.
Greenwood, Ontario
L0H 1H0

Mr. Mike Alex
Metro East Steelhead & Salmon
Fishermen
180 Station Street
Ajax, Ontario
L1S 1R9

Glenn & Jim Millson
Ontario Federation of Agriculture
R.R. #1
Enniskillen, Ontario
L0B 1H0

Mr. R.E. Nemish
The Claremont & District Community
Association
1763 Central Street
P.O. Box 280
Claremont, Ontario
L0H 1E0

Mr. John Noble
Ontario Federation of Agriculture
R.R. #2
Uxbridge, Ontario
L0C 1K0

Mr. Hugh Peacock
Durham Region Field Naturalists
499 Stone Street
Oshawa, Ontario
L1J 1A4

The Pickering Naturalists
P.O. Box 304
Pickering, Ontario
L1V 2R6

Pickering Rural Association
c/o Mr. Fred Beer
4945 Westney Road
Claremont, Ontario
L0H 1E0

Save the Rouge Valley System
Box 3031, Station B
Richmond Hill, Ontario
L4E 1A8

Save the Oak Ridges Moraine
Box 2209, Station B
Richmond Hill, Ontario
L4E 1A4

Mr. G. Willson
Friends of Whitevale
P.O. Box 10
Whitevale, Ontario
L0H 1M0

Ms. Catherine Guselle
Save The Ganaraska Again
45 Connaught Street
Oshawa, Ontario
L1G 2H1

Mr. John Martin
Sierra Club
69 Mary Elizabeth Crescent
Markham, Ontario
L3R 9T6

Pickering-Ajax Citizens Together (PACT) for the Environment
P.O. Box 125
Sheridan Place
1355 Kingston Road
Pickering, Ontario
L1V 1B8

Mr. Lloyd Thomas
Whitevale & District Residents Assoc.
Association
P.O. Box 28
Whitevale, Ontario
L0H 1M0

Mr. Ron Dillon
Durham Region Angler's Association
247 Acadia Drive
Oshawa, Ontario
L1G 1X9

Mrs. Joell Vanderwagen
Environmentalists Plan Transportation
34 Hillsdale Avenue West
Toronto, Ontario
M5P 1E8

Markham Ward 5 Ratepayers' Association

Mr. John Chisling
108 Sir Lancelot Drive
Markham, Ontario
L3P 2J4

Mr. Al Brown
82 Penny Crescent
Markham, Ontario
L3P 5X6

Mr. John Douglas
46 Reeve Drive
Markham, Ontario
L3P 4S2

Ms. Donna Shaw
R.R. #2
Markham, Ontario
L3P 3J3

Mr. Peter Ross
89 Main Street South
Markham, Ontario
L3P 1L6

Mr. Keith Boddaert
23 Rouge River Circle
R.R. #1
Box Grove, Ontario
L3P 3J2



FENCO ENGINEERS INC
ATRIA NORTH - PHASE II
2235 SHEPPARD AVE EAST
WILLOWDALE ONTARIO
CANADA M2J 5A6
TEL (416) 756 1333
FAX (416) 756 4998
TELEX 06 986781
CABLE LAVALIN TOR

HIGHWAY 407/TRANSIT TRANSPORTATION CORRIDOR ROUTE PLANNING AND ENVIRONMENT ASSESSMENT STUDY FROM HIGHWAY 48 TO HIGHWAY 35/115 W.P. 282-86-01 AND W.P. 326-88-01

The Ministry of Transportation is carrying out a study to determine the location and right-of-way requirements for the proposed Highway 407/Transit facility from Highway 48 in Markham easterly to Highway 35/115 in the Town of Newcastle (approximately 60 km). As proposed, Highway 407 will be an ultimate 10 lane freeway from Highway 48 easterly to the vicinity of Durham Road 34 (Courtice Road) in the Town of Newcastle. The remaining section to Highway 35/115 will be planned as an 8 lane freeway. The transit right-of-way will be planned from Highway 48 to approximately Durham Road 34.

The Ministry has selected a technically preferred route based on assessment and comparisons of environmental and engineering data, discussions with other government agencies and local municipalities and information received from the public. The proposed route will now be presented to the other agencies, the municipalities and the public for review and comment.

Public Information Centres have been arranged for the following dates and locations. All centres will be open to the public from 3:00 p.m. to 9:00 p.m.

Tuesday June 18, 1991	Markham Village Community Centre Highway 48 at Highway 7, Markham
Thursday June 20, 1991	Tyrone Community Centre Tyrone, Town of Newcastle
Tuesday June 25, 1991	Luther Vipond Memorial Arena 67 Winchester Road, Brooklin, Town of Whitby
Wednesday June 26, 1991	General W. Sikorski Polish Veterans Hall 1551 Stevenson Road North, City of Oshawa
Thursday June 27, 1991	Kahn Auction Barns Brock Road North, Town of Pickering (between Rossland Road and Taunton Road)

Interest Group Sessions:

To date many public interest groups have provided information and suggestions regarding the Highway 407 Route Planning Study.

To provide these and other interest groups an opportunity to discuss their specific areas of interest, the consultants and Ministry staff will be available at Interest Group Sessions from 2:00 pm. to 3:00 p.m. immediately prior to the regular information centre period.

Your group is invited to attend these sessions at any of the locations previously indicated.

We would appreciate your comments at the information centre and request that follow-up comments or requests for additional discussions regarding this phase of the study be forwarded by July 19, 1991.

Following the Public Information Centres, the Ministry will review all comments received. Additional investigations and modifications will be undertaken to address concerns and confirm the route's location. The next phase of the study, PRELIMINARY DESIGN, will provide plans in detail, the assessment of impacts and the mitigation measures proposed. The results of this final phase will be presented to the public in 1992 prior to preparation and submission of the Environmental Assessment Report.

Please note that information and comments regarding the study will be maintained as a public data base and will be kept on file for use during the study and, unless otherwise requested, may be included in the study documentation which is made available for public review.

If you require additional information regarding the information centres or the project in general, please contact one of the project team members listed below.

MARKHAM/PICKERING/WHITBY SECTION:

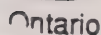
Mr. A.T. Minchev, or Mr. I.K. Upjohn
Fenco Engineers Inc.
Atria North - Phase II
2235 Sheppard Avenue East
Willowdale, Ontario
M2J 5A6
Telephone: (416) 756-1333

OSHAWA/NEWCASTLE SECTION:

Mr. D. Coutts, or Mr. R. Smith
Parker Consultants Limited
1400 Rymal Road East
Hamilton, Ontario
L0R 1P0
Telephone: (416) 385-3234

APPENDIX 4

SAMPLE ATTENDANCE SHEET AND COMMENT SHEET



Ontario

(Please Print)

[illegible]



Ontario

Ministry of
Transportation

Highway 407/Transit Transportation Corridor Highway 48 to Highway 35/115

Route Planning and Environmental Assessment Study

PUBLIC INFORMATION CENTRE SERIES #2 - JUNE 18, 20, 25, 26, 27, 1991

Comment Sheet

(Please Print)

Name _____

Mailing Address _____

Telephone Number _____

Property Location (if different from mailing Address) : _____

COMMENTS _____

This study is subject to the full requirements of the Environmental Assessment Act. An Environmental Assessment Report will be submitted to the Ministry of the Environment on completion of the study. Information and comments regarding the study will be maintained as a public data base and will be kept on file for use during the study and, unless otherwise requested, may be included in the study documentation which is made available for public review.

Either drop in box provided or mail to: Ontario Ministry of Transportation
Transportation Planning Section
Central Region
Atrium Tower, 3rd Floor
1201 Wilson Avenue
Downsview, Ontario
M3M 1J8

Thank you for your participation

**PUBLIC INVOLVEMENT
RESULTS OF PUBLIC CONSULTATION SESSIONS
FEASIBILITY STUDY
APRIL 3, 4, 1996**

MINISTRY OF TRANSPORTATION
STUDY TO ADDRESS TRAFFIC
AND ENVIRONMENTAL ISSUES ASSOCIATED
WITH THE OPENING OF HIGHWAY 407 AT MARKHAM ROAD

MINUTES OF APRIL 3 AND 4, 1996
PUBLIC CONSULTATION SESSIONS

OUR FILE: W.O. 3199-96

1. **Date:** Wednesday, April 3, 1996

Location: Markham Village Community Centre
 Town of Markham

Present: Approximately 215 attended (214 signed the register)

Paul Jankowski	MTO
Denise Morneau	MTO
Pat Reynolds	MTO
John Klowak	OTCC
Doug Allingham	TSH
Russell Brownlee	TSH
Bob Hodgins	McCormick Rankin
John Sutherns	McCormick Rankin
Leslie Scott	McCormick Rankin

2. **Date:** Thursday, April 4, 1996

Location: Kahn Auction Barns
 Town of Pickering

Present: Approximately 100 attended (96 signed the register)

Paul Jankowski	MTO
Denise Morneau	MTO
Doug Allingham	TSH
Russell Brownlee	TSH
Bob Hodgins	McCormick Rankin
John Sutherns	McCormick Rankin
Leslie Scott	McCormick Rankin

Purpose: To review the study findings to date and to solicit public comment.

MINUTES

1. FORMAT

The Public Consultation Sessions were organized as follows:

- 5:00 - 6:00 p.m. - Preview sessions for review agencies, interest groups and property owners
- 6:00 - 10:00 p.m. - Informal drop-in session where attendees were encouraged to review the display material, discuss the study with MTO staff and their consultants and fill out comment sheets.

2. NOTIFICATION

- A copy of the notice / brochure is provided as Attachment 1.
- Ontario Government Notices were placed in the following papers on Wednesday, March 27, 1996:
 - The Toronto Star
 - Markham Economist & Sun
 - Scarborough Mirror
 - Ajax / Pickering News Adviser

(copies of the notices are on file with MTO)

- approximately 750 brochures were mailed first class to MPPs, MPs, municipal clerks, review agencies, interest groups, property owners and those on applicable mailing lists from the earlier route planning study
- approximately 3,500 brochures were delivered by postman walk to the area in the Town of Markham located between Markham Road and 9th Line from Highway 7 south to 14th Avenue; and, the communities of Box Grove, Cedar Grove, Locust Hill, Green River, Whitevale, Brougham, Greenwood and Staxton Glen (see Attachment 2)

3. DISPLAY PANELS

A copy of the display panels is provided as Attachment 3. Information on display included:

- Introduction
- Overall Highway 407
- This Study

- Study Process / Schedule
 - Traffic Conditions
 - Existing Conditions
 - Existing Communities
 - Alternatives
 - Traffic Analysis
 - Analysis
 - Environmental Assessment Requirements
 - Next Steps
 - Standard MTO panels for
 - Freedom of Information Requirements
 - Aggregates
4. Copies of a key plan showing the alternatives were provided to all that attended (see Attachment 4).
5. Attached are:
- a summary of the verbal and written comments received
 - a summary of the written comments received by April 22, 1996

Minutes prepared by:

Leslie Scott
McCORMICK RANKIN

LLS/nc

SUMMARY OF COMMENTS RECEIVED AT AND FOLLOWING
APRIL 3 AND 4, 1996 PUBLIC CONSULTATION SESSIONS

(also see attached table which summarizes written comments received by April 22, 1996)

1. Wednesday, April 3, 1996, Town of Markham

- approximately 215 attended
- 76 written comments were received
- many people noted that Markham Road is too busy and congested now
- many noted the need to protect/maintain/enhance "Old Markham"
- many expressed concern about Highway 407 terminating at Markham Road
- the extension of Highway 407 to the Markham Bypass as a minimum was supported by many people
- a number of people requested that access to and from Markham Road north of Highway 407 be restricted
- following the Public Consultation Session, a letter was received from representatives of the Old Markham Village Ratepayers Inc., Vinegar Hill Ratepayers Association, Reeve Drive Ratepayers Association, the Old Markham Village Business Improvement Area advising that:
 - main interest is maintaining integrity of Old Village of Markham
 - should discourage provincial/regional traffic from using Highway 48 through the Old Village
 - do not support opening of Highway 407 at Markham Road
 - support 407 extension to Markham Bypass
 - support opening of 407 to McCowan Road in the interim
 - with extension to Markham Bypass, support access to and from the south only at Highway 407/Markham Road
- two representatives of Save the Rouge Valley System attended the session and subsequently expressed concerns about proposed Highway 407 east of Markham Road

2. Thursday, April 4, 1996, Town of Pickering

- approximately 100 attended
- 24 written comments were received
- many people were involved in the earlier route planning study and exhibited a general recognition and/or acceptance of the extension of Highway 407 from Markham Road to Highway 35/115
- the main focus was on the status and timing of Highway 407 from Markham Road to Highway 35/115
- many expressed concern with existing levels of traffic through the existing hamlets/communities
- many expressed the need to "get on with it" in order to terminate the general uncertainty in the area

- a number of attendees enquired about property issues and requested information about MTO's process for acquiring property
- the need for a 401/407 link in this area was identified by a number of people
- subsequently a request for additional information and a meeting was received from the Whitevale and District Residents' Association

**SUMMARY OF WRITTEN COMMENTS
RECEIVED BY APRIL 22, 1996**

Page 1 of 2

	April 3, 1996	April 4, 1996	Total
GENERAL			
Preview Session Sign-In	22	12	34
Public Consultation Sign-In	192	84	276
Comment Sheets Received at the PCS	76	24	100
Comment Sheets Received After the PCS	8	15	23
TRAFFIC			
• Markham Road too busy / congested, etc.	46	1	47
• Do not end at Markham Road	32	2	34
• Other traffic issues:	Highway 7 14th Avenue 9th Line Existing Residential Roads Highway 401 Whitevale		
ALTERNATIVES			
• Proceed east of Markham Road	9	2	11
• Proceed to: Markham Bypass	36	2	38
Town Line	7	2	9
Brock Road	13	7	20
35/115	5	1	6
• Proceed to: McCowan Road	6	0	6
Markham Bypass or 9th Line	4	0	4
Ajax	0	1	1
Whitby	0	1	1
Durham Region	0	1	1
Past Oshawa	0	1	1
MARKHAM ROAD (HIGHWAY 48)			
• Restrict moves at Markham Road	20	0	20
• No moves at Markham Road	4	0	4

**SUMMARY OF WRITTEN COMMENTS
RECEIVED BY APRIL 22, 1996**

Page 2 of 2

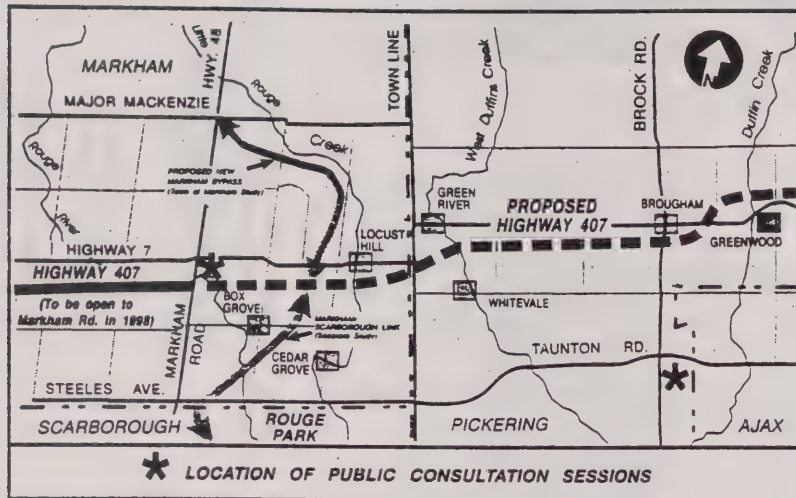
	April 3, 1996	April 4, 1996	Total
HIGHWAY 407 IN GENERAL			
<ul style="list-style-type: none"> Do not support Hwy 407 (some respondents specifically identified Hwy 407 east of Markham Road, some did not and others appeared to address Hwy 407 in general) 	7	11	18
<ul style="list-style-type: none"> Reasons for not supporting Hwy 407 included impacts on: Agriculture, Natural Environment, Heritage Resources, Existing Communities such as Whitevale and Locust Hill, (noise, traffic, "pollution") 			
COMMENTS / CONCERNS REGARDING EA PROCESS			
<ul style="list-style-type: none"> Do not support EA process in general 	4	1	5
<ul style="list-style-type: none"> Concerns with / do not support EA exemption / "fast-tracking" 	4	1	5
OTHER ISSUES			
<ul style="list-style-type: none"> Other comments / concerns included: 	<ul style="list-style-type: none"> "do something" / "get on with it" protection of heritage resources natural environment agricultural preservation impacts on existing communities noise light pollution trucks - existing and future expropriation timing compensation for property transit alternatives severed property access 		

ONTARIO GOVERNMENT NOTICE

STUDY TO ADDRESS TRAFFIC AND
ENVIRONMENTAL ISSUES ASSOCIATED WITH
THE OPENING OF HIGHWAY 407 AT MARKHAM ROAD

Highway 407 is planned to open to Markham Road in 1998. The Ministry of Transportation has initiated a study to assess traffic conditions and opportunities for addressing them in the vicinity of Markham Road at the time of planned opening. The subject area is shown on the key plan.

At the same time, the Ministry of Transportation's planning studies for the easterly extension of Highway 407 from Markham Road to Highway 35/115 are ongoing.



Two Public Consultation Sessions are scheduled to review the study findings to date and solicit public input:

WEDNESDAY, APRIL 3, 1996

6:00 - 10:00 p.m.

MARKHAM VILLAGE COMMUNITY CENTRE
6041 Highway 7
(SE corner of Hwy 7
and Markham Road)
Town of Markham

THURSDAY, APRIL 4, 1996

6:00 - 10:00 p.m.

KAHN AUCTION BARN
2699 Brock Road North
(between Rossland Rd and Taunton Rd)
Town of Pickering

(Please note that the Kahn Auction Barns location is wheelchair accessible, but the Markham Village Community Centre is not.)

These will be informal drop-in information sessions where Ministry staff and their consultants will be available to discuss the study, answer questions and receive your comments. Anyone with an interest in the study is urged to attend.

FOR FURTHER INFORMATION, PLEASE CONTACT:

Ms. Denise Morneau, P. Eng.
Ministry of Transportation
3rd Floor, Atrium Tower
1201 Wilson Avenue
Downsview, Ontario
M3M 1J8

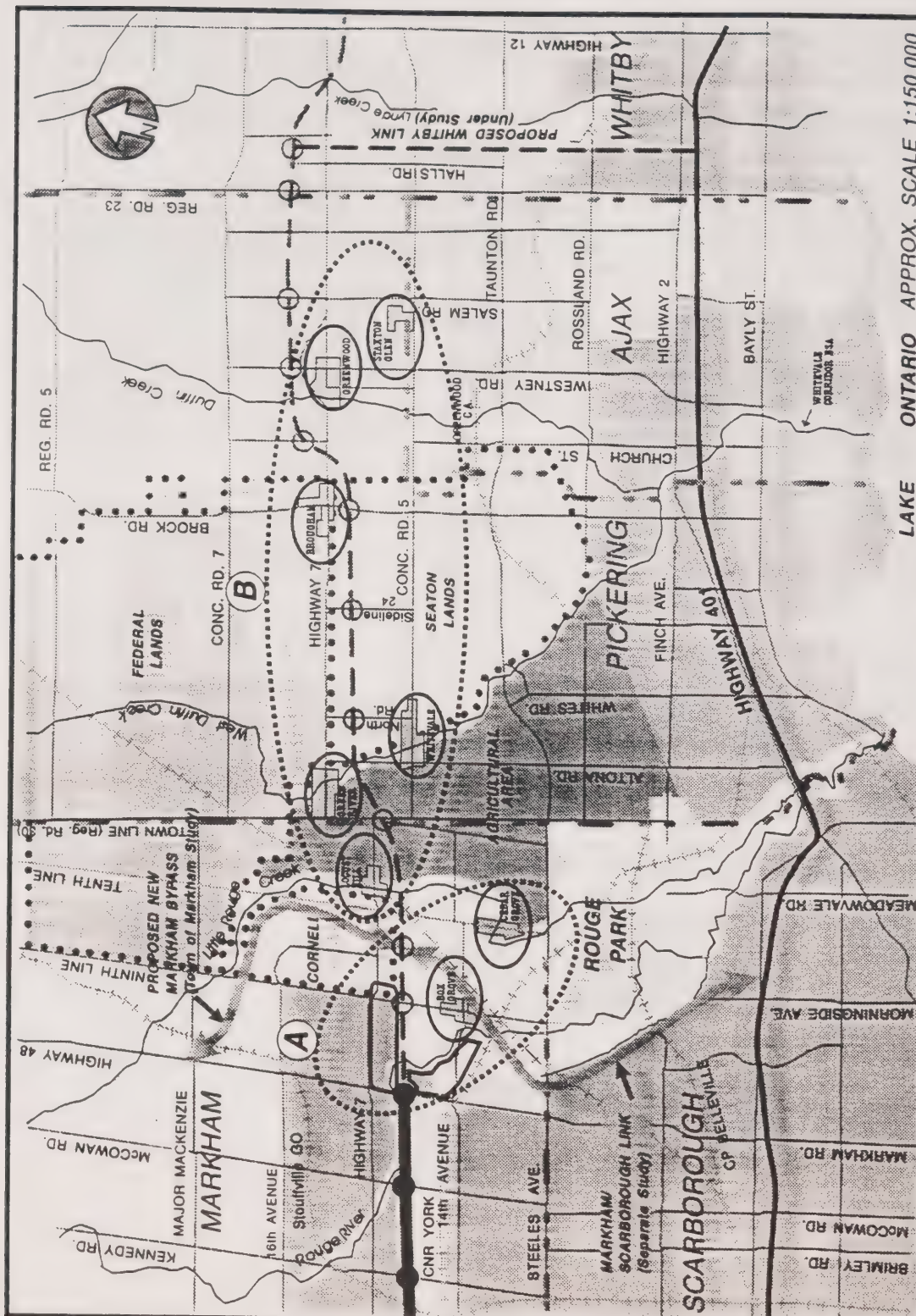
Phone: (416) 235-5489
Fax: (416) 235-4940

Mr. John Sutherns, P. Eng.
McCormick Rankin
2655 North Sheridan Way
Mississauga, Ontario
L5K 2P8

Phone: (905) 823-8500
Fax: (905) 823-8503

With the exception of personal information, all comments will become part of the public record.

Printed on
Recycled Paper



LAKE ONTARIO APPROX. SCALE 1:150,000

MAILING AREAS

Brochures delivered to
areas outlined in black

- (A) - Markham Post Office
(B) - Locust Hill Post Office

LEGEND

- HIGHWAY 407 CENTRAL
(To be constructed to Highway 48 by 1998)
- PROPOSED HIGHWAY 407 EAST/TRANSIT
(Technically preferred route)
- PROPOSED INTERCHANGES



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Transportation

ATTACHMENT 3
STUDY TO ADDRESS TRAFFIC AND
ENVIRONMENTAL ISSUES ASSOCIATED WITH
THE OPENING OF HIGHWAY 407 AT MARKHAM ROAD

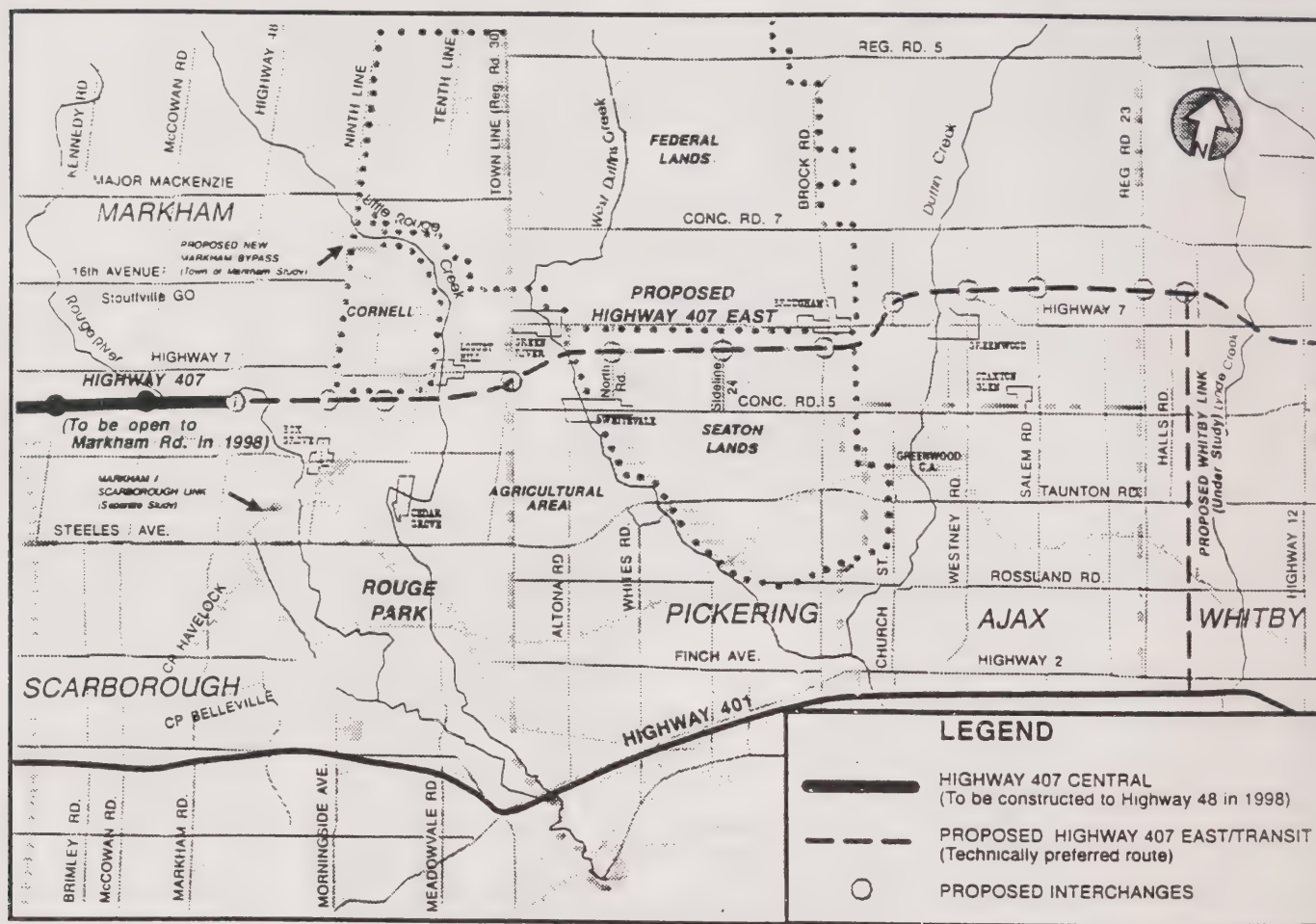
**DISPLAY PANELS FOR APRIL 3 AND 4, 1996
PUBLIC CONSULTATION SESSIONS**

PANELS

- INTRODUCTION
- OVERALL HIGHWAY 407
- THIS STUDY
- STUDY PROCESS / SCHEDULE
- TRAFFIC CONDITIONS
- EXISTING CONDITIONS
- EXISTING COMMUNITIES
- ALTERNATIVES
- TRAFFIC ANALYSIS
- ANALYSIS
- ENVIRONMENTAL ASSESSMENT REQUIREMENTS
- NEXT STEPS
- STANDARD MTO PANELS RE:
 - Freedom of Information Requirements
 - Aggregates

INTRODUCTION

Highway 407 is planned to open to Markham Road in 1998. The Ministry of Transportation has initiated a study to assess traffic conditions and opportunities for addressing them in the vicinity of Markham Road at the time of planned opening. The subject area is shown on the key plan.



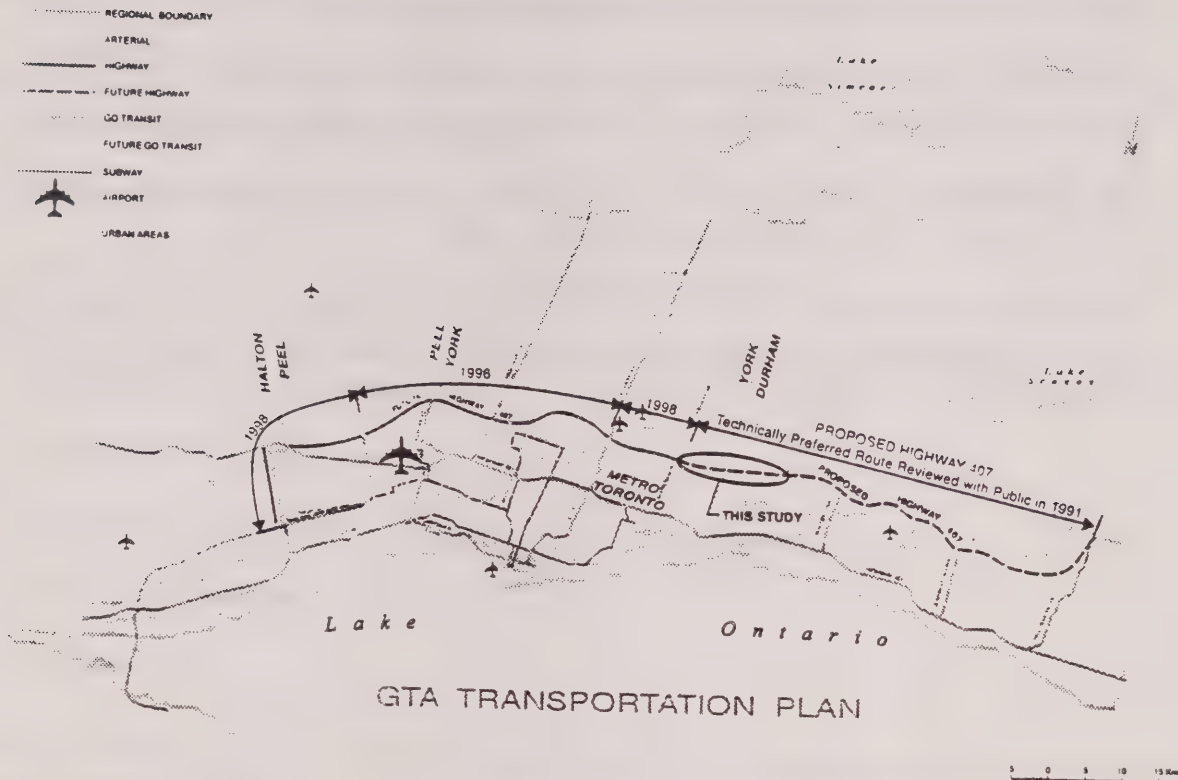
This Public Consultation Session has been arranged to obtain public comment and input regarding the anticipated traffic conditions and analysis of alternatives, prior to a preferred alternative being determined.



PLEASE REVIEW THE INFORMATION,
DISCUSS WITH STUDY STAFF AND
PROVIDE ANY COMMENTS ON THE
SHEETS PROVIDED.



OVERALL HIGHWAY 407



- The concept of Highway 407 was initially considered during the 1940's and 1950's.
- A corridor, located within the Parkway Belt, was subsequently identified west of Markham Road.
- In 1993, the province announced the funding for the acceleration of Highway 407 construction west of Markham Road. Subsequently in May 1994, the province announced a contract to develop, design and build Highway 407 from Highway 403 in Mississauga to Markham Road in Markham.
- East of Markham Road, the province commenced route planning in 1989, which is still underway.

The technically preferred route for Highway 407 east of Markham Road was reviewed with the public in 1991.



THIS STUDY

- Highway 407 is planned to open at Markham Road in 1998.
- The Town of Markham has identified strong concerns about traffic volumes on Markham Road (north and south of Highway 7) with the opening of Highway 407.
- The construction of the remainder of Highway 407 from Markham Road to Highway 35/115, however, will not occur until beyond 1998.
- Therefore, in the short term, the Ministry of Transportation, in consultation with its municipal partners, is carrying out this study to address potential traffic concerns associated with the opening of Highway 407 at Markham Road.

(INCLUDE PHOTOS OF EXISTING MARKHAM ROAD)



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STUDY TO ADDRESS TRAFFIC AND
ENVIRONMENTAL ISSUES ASSOCIATED WITH
THE OPENING OF HIGHWAY 407 AT MARKHAM ROAD

STUDY PROCESS / SCHEDULE

The study started in January 1996. The main study phases are:

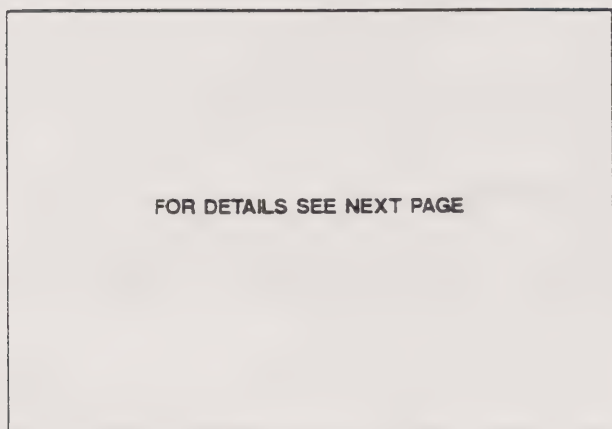
- Collection of background data
- Problem identification / quantification
- Identification of alternatives
- Consultation with municipalities and technical agencies
- Consultation with the public including property owners and interest groups. (April 3 and 4, 1996 Public Consultation Sessions)
- Assessment of alternatives
- Identification of environmental assessment process requirements
- Detailing of preferred alternative
- Documentation

In order to implement any interim improvements by 1998, the study is progressing on a 'fast track' basis. Given this time constraint, several study phases are running concurrently.



TRAFFIC CONDITIONS

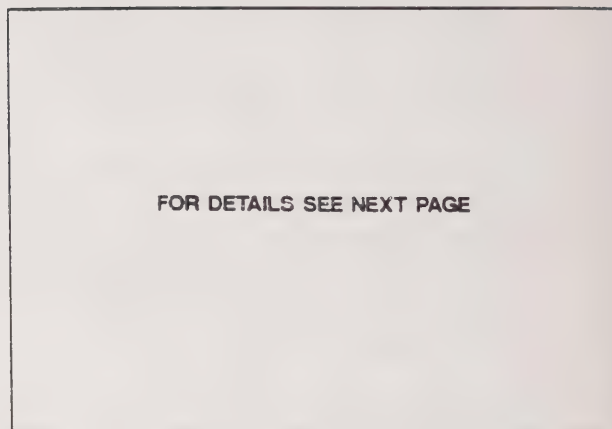
EXISTING (AM PEAK HOUR)



FOR DETAILS SEE NEXT PAGE

NO HIGHWAY 407

1998 PROJECTIONS (AM PEAK HOUR)



FOR DETAILS SEE NEXT PAGE

HIGHWAY 407 TO MARKHAM ROAD

EXISTING

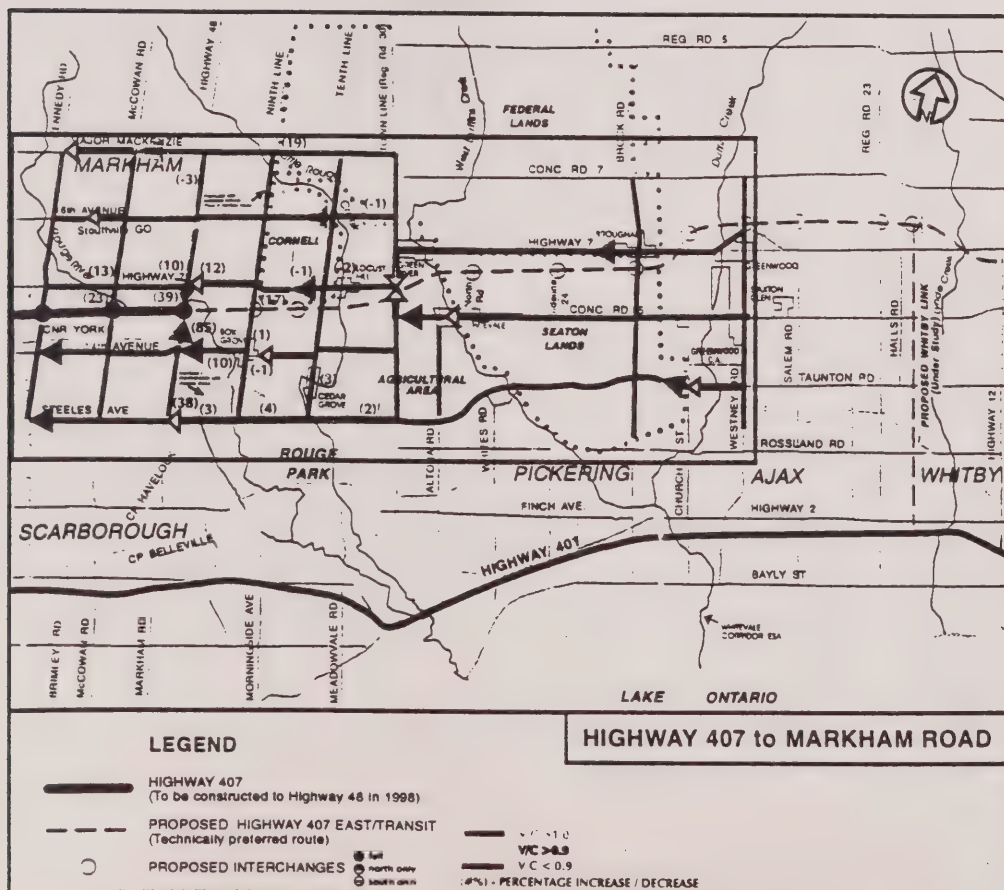
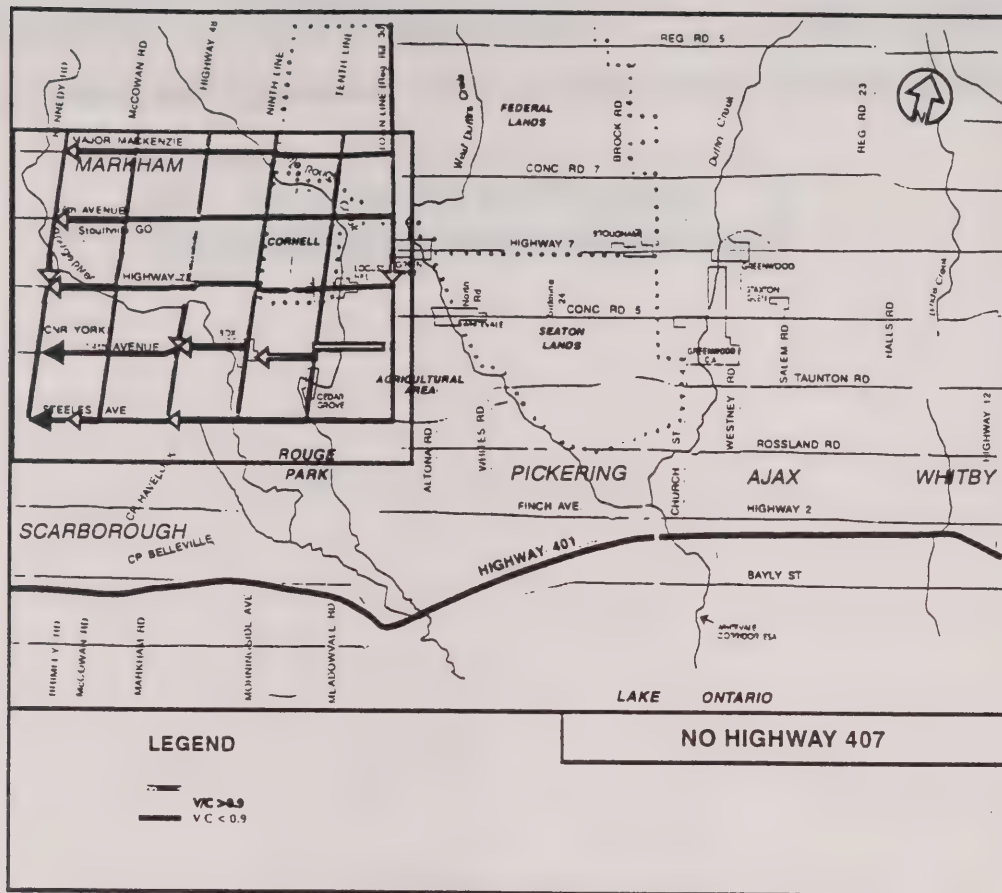
- roadway links and intersections currently operating at or close to capacity include:
 - southbound Markham Road north and south of Highway 7
 - Highway 7 west of Markham Road
 - 14th Avenue east of Markham Road
 - Steeles Avenue
 - intersection of Highway 7 / Markham Road

1998 PROJECTIONS

- increase in existing capacity and operational problems
- significant traffic increases are projected on Markham Road south of Highway 7
- likely result in spillover effects to other roadways in the area and likely affect ability of motorists to access Highway 407

CONCLUSION

The existing operational deficiencies will be compounded by the opening of Highway 407 at Markham Road.





EXISTING CONDITIONS

(USE 1:10,000 AERIAL MOSAIC)



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STUDY TO ADDRESS TRAFFIC AND
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EXISTING COMMUNITIES

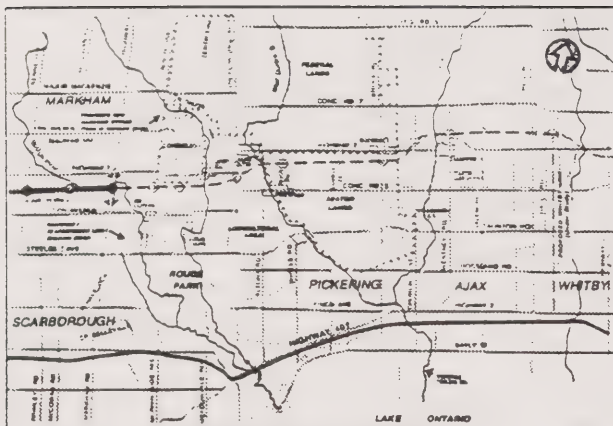
PHOTOGRAPHS OF EXISTING COMMUNITIES:

- Main Street Markham
- Box Grove
- Locust Hill
- Green River
- Whitevale
- Brougham
- Greenwood

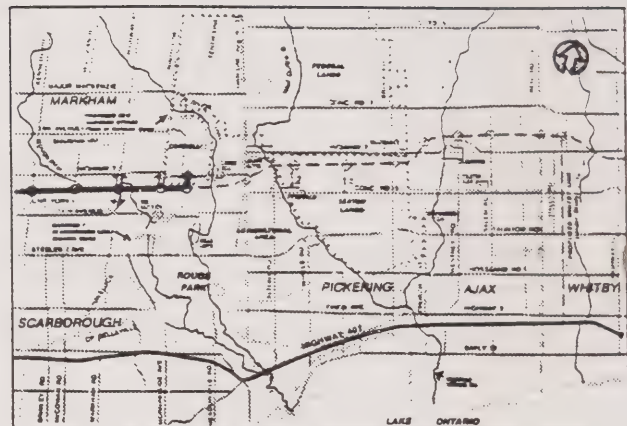


ALTERNATIVES

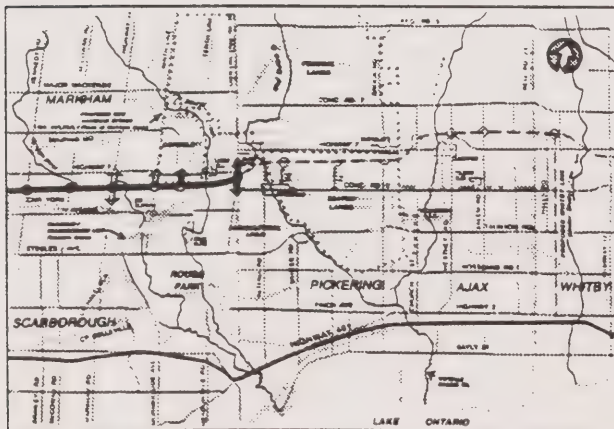
COLOUR PLANS OF:



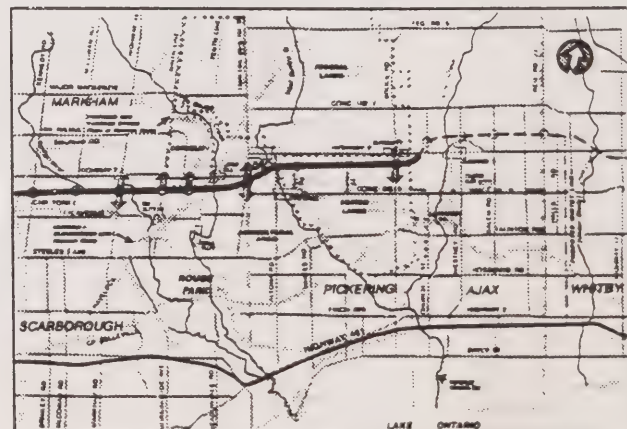
HIGHWAY 407 to MARKHAM ROAD



HIGHWAY 407 to MARKHAM BYPASS

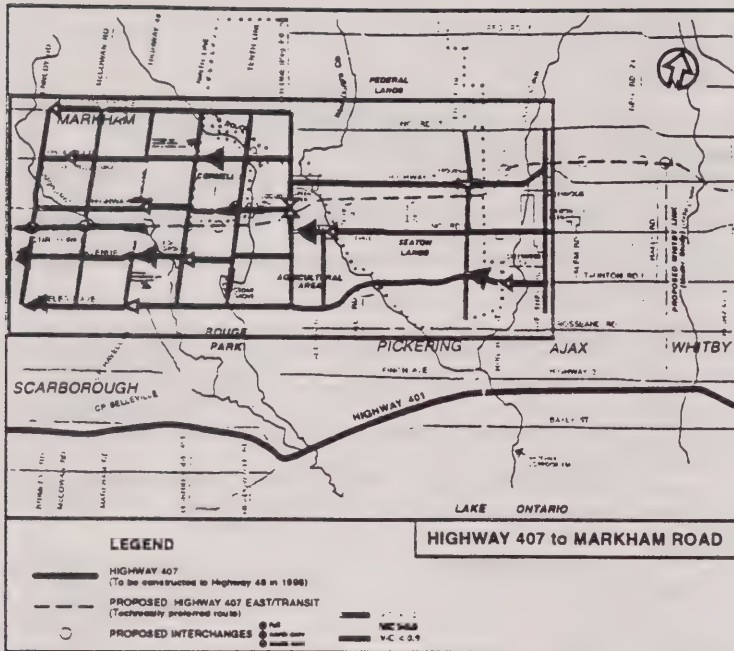


HIGHWAY 407 to TOWN LINE

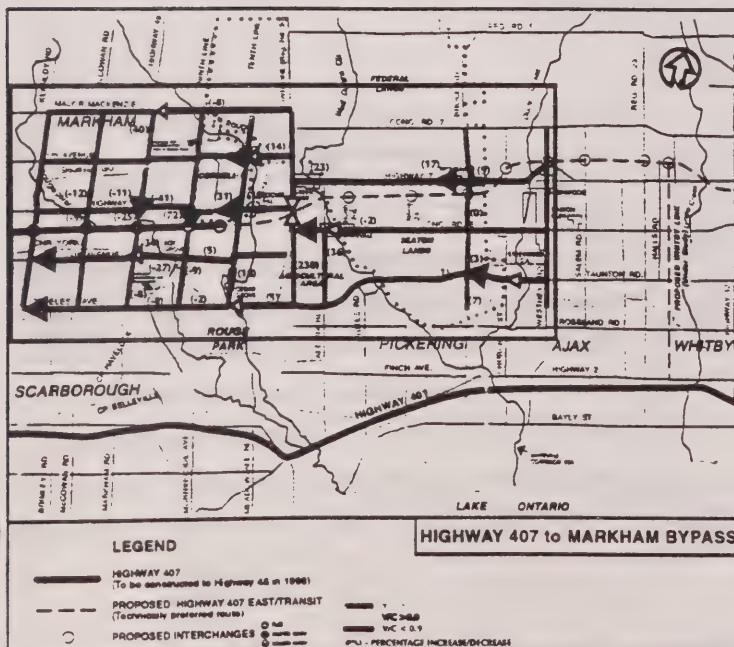


HIGHWAY 407 to BROCK ROAD

TRAFFIC ANALYSIS



BASE CASE

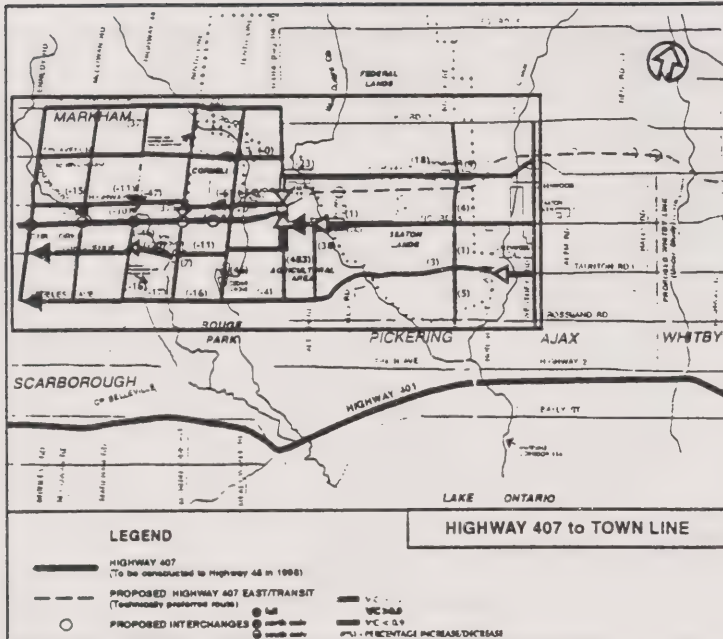


**OPTION 98-322
HIGHWAY 407 TO MARKHAM BYPASS
(FOUR LANE FREEWAY - LENGTH 3.425 KM)**

- Reduced Volume (25%) on Markham Road South of Highway 7 - Southbound
- Reduced Volume (11%) on Markham Road North of Highway 7 - Northbound
- Reduced Volume (41%) on Highway 7 East of Markham Road - Westbound
- Reduced Volumes through Box Grove Community
- Increased Volume (31%) on Highway 7 West of 10th Line - Westbound
- Increased Volume (23%) on Highway 7 East of Road 30 - Westbound
- Increased Volume (72%) on 9th Line South of Highway 7 - Southbound
- Increased Volumes through Locust Hill, Green River and Brougham
- No Impact on Whitevale

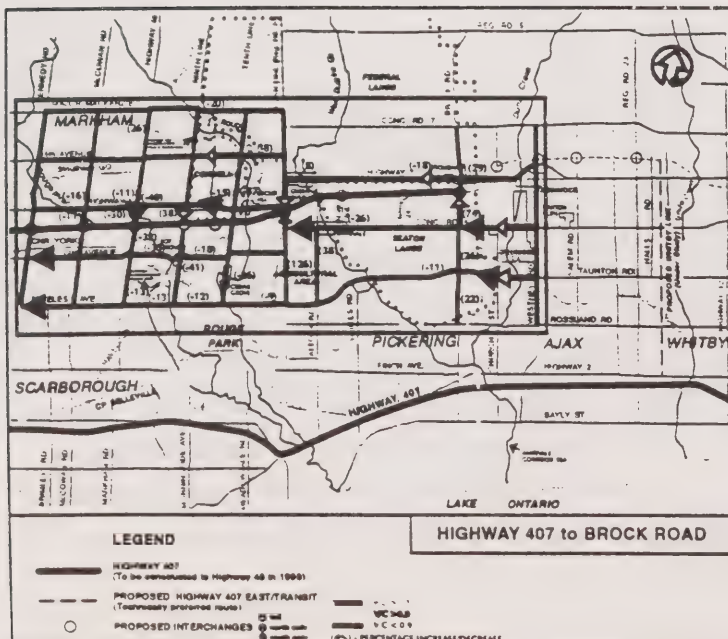


TRAFFIC ANALYSIS



OPTION 98-342 HIGHWAY 407 TO YORK-DURHAM BOUNDARY (Town Line) (FOUR LANE FREEWAY - LENGTH 6.5 KM)

- Reduced Volume (30%) on Markham Road South of Highway 7 - Southbound
- Reduced Volume (11%) on Markham Road North of Highway 7 - Southbound
- Reduced Volume (6%) on Highway 7 West of 10th Line - Westbound
- Reduced Volumes through Box Grove and Locust Hill
- Increased Volume (23%) on Highway 7 East of Road 30 - Westbound
- Increased Volume (37%) on 9th Line South of Highway 7 - Southbound
- Increased Volume (18%) on Highway 7 West of Brock Road - Westbound
- Increased Volumes through Green River and Brougham
- No Impact on Whitevale



OPTION 98-353 HIGHWAY 407 TO BROCK ROAD (FOUR LANE FREEWAY - LENGTH 13.7 KM)

- Reduced Volume (30%) on Markham Road South of Highway 7 - Southbound
- Reduced Volume (11%) on Markham Road North of Highway 7 - Southbound
- Reduced Volume (40%) on Highway 7 East of Markham Road - Westbound
- Reduced Volumes through Box Grove, Locust Hill and Whitevale
- Reduced Volumes on Highway 7 through Brougham West of Brock Road
- Increased Volume (38%) on 9th Line South of Highway 7 - Southbound
- Increased Volume (29%) on Highway 7 East of Brock Road - Westbound (Brou



ANALYSIS

April 1, 1996

	ALTERNATIVES			
	TO MARKHAM ROAD	TO MARKHAM BYPASS	TO TOWN LINE	TO BROCK ROAD
TRANSPORTATION				
• Projected traffic volumes on Hwy 407 west of McCowan Road (a.m. p.m. hr)	2500	3300	3500	3700
• Network impacts (1998 - a.m. p.m. hr)	See traffic analysis panel			
NATURAL ENVIRONMENT				
• relationship to major river crossings	--	advances Hwy 407 crossing of: • Rouge River valley	advances Hwy 407 crossing of: • Rouge River valley • Little Rouge Creek valley	advances Hwy 407 crossing of: • Rouge River valley • Little Rouge Creek valley • West Duffins Creek valley • tributary of Duffins Creek
• relationship to woodlots		advances impacts to woodlots resulting from Highway 407 East		
SOCIAL ENVIRONMENT				
• Changes to traffic volumes through the community (a.m. p.m. hr)	See table			
ECONOMIC ENVIRONMENT				
• access to existing and future development	limited access to existing Markham (Markham Road - 2 lanes)	additional access to existing Markham: advances provision of access to future Cornell community	additional access to existing Markham and Durham: advances provision of access to future Cornell community and limited access to Federal Lands and Section	additional access to existing Markham and Durham: advances provision of access to future Cornell community and access to Federal Lands and Section
AGRICULTURE				
• relationship to Duffin - Rouge agricultural area	--	--	advances impacts on agr. area: • Hwy 407 - 1.6 km • realigned Hwy 7 - 1.7 km	advances impacts on agr. area: • Hwy 407 - 2.5 km • realigned Hwy 7 - 1.7 km
CULTURAL ENVIRONMENT				
• heritage buildings	--	advances removal of 2	advances removal of 5	advances removal of 11
• archaeological (known sites)		2	4	6
COST / REVENUE				
• self-financing/	0 (base case)	Yes	Yes	Yes
PROPERTY CONSIDERATIONS				
• relationship to properties owned by Ontario Realty Corporation (ORC)	--	All alternatives require lands not owned by ORC located between Highway 407 and to the east of 9th Line. may require lands not owned by ORC east of Brock Road		

Community Impacts

407 Terminates at	Green River		Whitevale		Locust Hill		Box Grove East		Box Grove West	
	Highway 7 East of Road 30 (WB)		Conc. Rd. 8 East of Altona Rd. (WB)		Highway 7 East of 10th Line (WB)		14th Avenue East of 9th Line (WB)		14th Avenue West of 9th Line (WB)	
	Increase/Decrease		Increase/Decrease		Increase/Decrease		Increase/Decrease		Increase/Decrease	
	Volume	% Over Base Condition	Volume	% Over Base Condition	Volume	% Over Base Condition	Volume	% Over Base Condition	Volume	% Over Base Condition
Markham Road	-	-	-	-	-	-	-	-	-	-
Markham By-Pass	173	23%	-12	-2%	83	10%	36	5%	-275	-27%
Road 30	176	23%	-3	-1%	-451	-54%	-85	-11%	-200	-10%
Brock Road	60	8%	-134	-26%	-394	-47%	-75	-10%	-358	-35%

407 Terminates at	Brougham East		Brougham West		Greenwood East		Greenwood West	
	Highway 7 East of Brock Road		Highway 7 West of Brock Road		6th Conc. Road East of Westney		6th Conc. Rd. West of Westney	
	Increase/Decrease		Increase/Decrease		Increase/Decrease		Increase/Decrease	
	Volume	% Over Base Condition	Volume	% Over Base Condition	Volume	% Over Base Condition	Volume	% Over Base Condition
Markham Road	-	-	-	-	-	-	-	-
Markham By-Pass	51	9%	103	17%	13	15%	74	46%
Road 30	59	9%	109	18%	75	85%	65	40%
Brock Road	198	29%	-109	-18%	90	102%	178	91%



ENVIRONMENTAL ASSESSMENT REQUIREMENTS

Any alternative solution will be subject to the following Environmental Assessment requirements:

- Federal
 - In accordance with the Canadian Environmental Assessment Act (CEAA)

- Provincial
 - In accordance with the Ontario Environmental Assessment Act (EAA)
 - Requirements can be addressed by:
 - an individual EA.
 - a Class EA, or
 - an exemption
 - The method for meeting the requirements of the EAA for this study, is currently under consideration.
 - It should be noted, however, that the same level of environmental mitigation would be provided under each method. The main difference is the formal review and approval process.



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STUDY TO ADDRESS TRAFFIC AND
ENVIRONMENTAL ISSUES ASSOCIATED WITH
THE OPENING OF HIGHWAY 407 AT MARKHAM ROAD

NEXT STEPS

- Review public comments
- Determine preferred alternative
- Confirm environmental assessment requirements
- Prepare Feasibility Study Report



PLEASE REVIEW THE INFORMATION,
DISCUSS WITH STUDY STAFF AND
PROVIDE ANY COMMENTS ON THE
SHEETS PROVIDED.



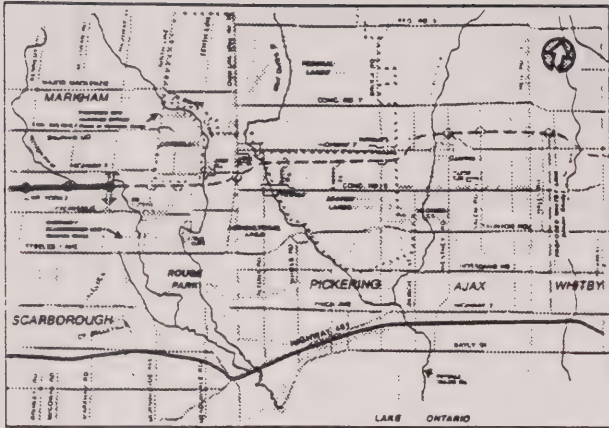


THIS STUDY

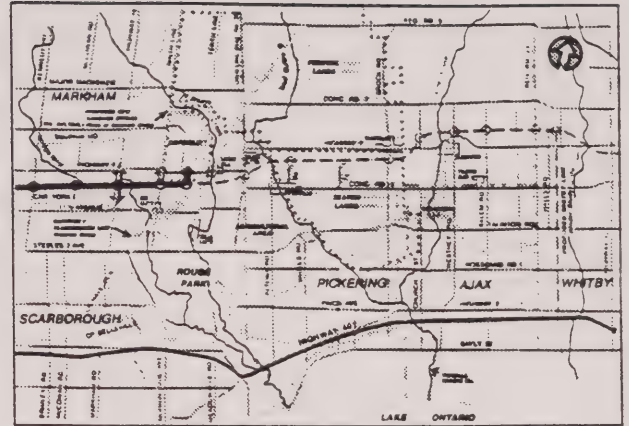
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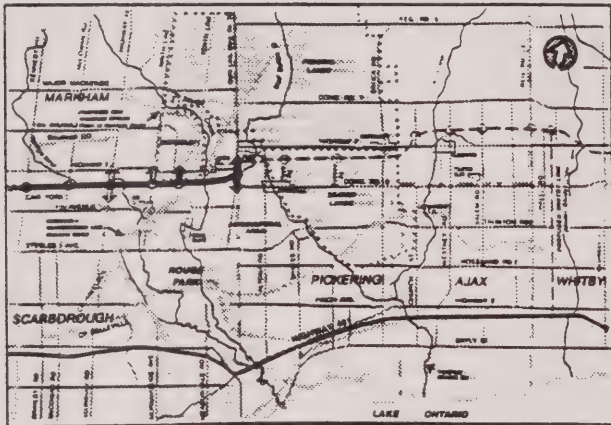
ALTERNATIVES



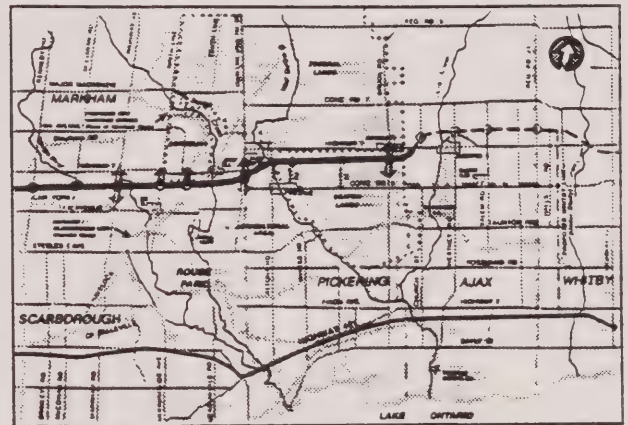
HIGHWAY 407 to MARKHAM ROAD



HIGHWAY 407 to MARKHAM BYPASS



HIGHWAY 407 to TOWN LINE



HIGHWAY 407 to BROCK ROAD

(AS REVIEWED AT PUBLIC CONSULTATION SESSIONS)



**PUBLIC INVOLVEMENT
RESULTS OF PUBLIC CONSULTATION SESSIONS
FEASIBILITY STUDY
NOVEMBER 6, 7, 1996**

MINISTRY OF TRANSPORTATION
HIGHWAY 407 PARTIAL EXTENSION
ENVIRONMENTAL ASSESSMENT STUDY

MINUTES OF NOVEMBER 6 and 7, 1996
PUBLIC CONSULTATION SESSIONS

OUR FILE: 3369-96

1. Date: Wednesday, November 6, 1996

Location: Markham Village Community Centre
Town of Markham

Present: Approximately 150 attended (142 signed the register)

Paul Jankowski	MTO
Denise Morneau	MTO
Pat Reynolds	MTO
Paul Sambrook	MTO
Dominic Sgro	MTO
Doug Allingham	TSH
Joanna Musters	TSH
Bob Hodgins	Ecoplans
John Sutherns	McCormick Rankin
Leslie Scott	McCormick Rankin
Dave Ducheck	McCormick Rankin

2. Date: Thursday, November 7, 1996

Location: Kahn Auction Barns
Town of Pickering

Present: Approximately 135 attended (131 signed the register)

Paul Jankowski	MTO
Denise Morneau	MTO
Pat Reynolds	MTO
Dominic Sgro	MTO
Danny Sabatini	MTO
Doug Allingham	TSH
Joanna Musters	TSH
Bob Hodgins	Ecoplans
John Sutherns	McCormick Rankin
Leslie Scott	McCormick Rankin
Dave Ducheck	McCormick Rankin

Purpose: To review and solicit public comments regarding the study findings including the proposed Partial Extension of Highway 407 to Highway 7, east of Brock Road.

MINUTES:

1. Format

The Public Consultation Sessions were organized as follows:

- 5:00 - 6:00 p.m. Preview session for review agencies, interest groups and property owners.
- 6:00 - 9:00 p.m. Informal drop-in sessions where attendees were encouraged to review the display material, discuss the study with MTO staff and their Consultants, and fill out comment sheets.

2. Notification

- A copy of the notice / brochure is provided as Attachment 1.
- Ontario Government Notices were placed in the following papers on Wednesday, October 30, 1996:
 - The Toronto Star
 - Markham Economist & Sun
 - Scarborough Mirror
 - Ajax / Pickering News Advisor

(copies of the notices are on file with MTO)

- Approximately 975 brochures were mailed first class to MPPs, MPs, municipal clerks, review agencies, interest groups, property owners, those who attended the April 1996 Public Consultation Sessions, and those on applicable mailing lists from the earlier route planning and related studies.
- Approximately 3,500 brochures were delivered by postman walk to the area in the Town of Markham, located between Markham Road and 9th Line from Highway 7 south to 14th Avenue; and, the communities of Box Grove, Cedar Grove, Locust Hill, Green River, Whitevale, Brougham, Greenwood and Staxton Glen (see Attachment 2).

3. Display Panels

A copy of the display panels is provided as Attachment 3.

- Introduction
- Overall Highway 407
- Highway 407 East / System Planning
- Route Planning
- Feasibility Study
- Feasibility Study - Public Comments
- Feasibility Study - Findings
- Environmental Assessment Submission
- Proposed Partial Extension
 - 1:10,000 Mosaic (2 copies of panel)
 - 1:10,000 Preliminary Plan and Profile
- Benefits and Effects
- Stakeholder Consultation Process
- Next Steps
- Standard MTO Panels re:
 - Freedom of Information Requirements
 - Aggregates

4. Copies of a Highway 407 Partial Extension Fact Sheet, including a key plan, were available to all that attended (Attachment 4).
5. Transcripts of comments written by the public, on flip charts provided at the PCSs, are included as Attachment 5.
6. Attached is a summary of written and verbal comments received by November 18, 1996.

Minutes prepared by:

Dave Ducheck
McCORMICK RANKIN

DD/nc
Attachments

HIGHWAY 407 PARTIAL EXTENSION

SUMMARY OF COMMENTS RECEIVED AT AND FOLLOWING PUBLIC CONSULTATION SESSIONS NOVEMBER 6 & 7, 1996

1. **Wednesday, November 6, 1996**
Town of Markham

- approximately 150 attended
 - 62 written comments were received by November 18, 1996
-

Verbal Comments

- while most people supported the Partial Extension, a number of people expressed concerns about property, noise effects, and the traffic impacts on Markham Road / Highway 48.
-

Written Comments

- majority of people identified their support for Highway 407 Partial Extension
- many of the supporters expressed concerns with traffic on Markham Road in general and particularly with the opening of Highway 407 at Markham Road
- a few people do not support the extension and suggested that Highway 407 end at Highway 404 or McCowan Road

Comments re: Markham Road

- some people expressed concerns with the following:
 - traffic on Main Street, in general
 - truck traffic on Main Street
 - community impact (Old Markham)
- some people suggested access to and from the south only at Markham Road
- others suggested removal of the interchange at Markham Road

Other Comments

- some people had questions about noise in general, while a few people addressed concern about noise at specific locations, such as:
 - Markham Road
 - Colonel Butler Drive
 - 9th Line
- some people identified concerns about the natural environment including:
 - woodlots
 - wildlife
 - Rouge Valley and Robinson Creek
 - pollution
- a few people asked about other regional / municipal roads, such as:
 - Steeles Avenue (widening?)
 - 9th Line (traffic increase)
 - McCowan Road (improvements?)
 - Kennedy Road (improvements?)
- a few people had other questions or concerns about:
 - loss of farm land
 - urban sprawl
 - 9th Line interchange (both for and against)
 - north / south links to Highway 401
 - too many interchanges (specifically York-Durham Line, North Road)
 - traffic volumes through the community of Box Grove
 - transit should be the first priority
 - lighting
 - noise barriers
 - cost, who will finance?

2. Thursday, November 7, 1996
Town of Pickering

- approximately 135 attended
 - 31 written comments were received by November 18, 1996
-

Verbal Comments

- while most people supported the Partial Extension, a number of people expressed concerns or questions about property, timing of Highway 407 East (to Highway 35/115), future changes to Brock Road, and the traffic impacts on the communities of Greenwood, Brougham and Whitevale
-

Written Comments

- majority of people support Highway 407 Partial Extension
- a few supporters expressed concerns with the termination at Markham Road
- a number of people suggested that Highway 407 be extended further east to:
 - Durham Road 23
 - north / south link to Highway 401
 - Highway 35/ 115
- a few people were concerned about noise in general
- a few people expressed concerned about the traffic impacts on the communities of Brougham and Greenwood
- a number of people identified concerns about regional / municipal roads, including:
 - Steeles Avenue (widening?)
 - Taunton Road (widening?)
 - Highway 7 (traffic volume impacts - Brooklin area)
 - Brock Road (realignment?, widening?)
 - Lakeridge Road (possible link to Highway 401?)
 - Salem Road (traffic volume?)
- a few people had other questions / concerns about:
 - transit as a first priority
 - increased traffic on Highway 7 (east of Brock Road)
 - north / south links to Highway 401
 - too many interchanges
 - interchange at Brock Road / Highway 7

HIGHWAY 407 PARTIAL EXTENSION

SUMMARY OF WRITTEN COMMENTS RECEIVED AT AND FOLLOWING PUBLIC CONSULTATION SESSIONS November 6 & 7, 1996

Page 1

	Nov. 6/96	Nov. 7/96	Total
ATTENDANCE / RESPONSE			
Preview session sign-in	18	7	25
Public consultation sign-in	124	124	248
Comment sheets received at PCS	51	29	80
Comment sheets received after the PCS	11	2	13
GENERAL			
Support Highway 407 Partial Extension in general	8	11	19
Support Partial Extension but concerned with termination of Highway 407 at Markham Road	14	2	16
Support Partial Extension but concerned with traffic on Markham Road	8	-	8
Do not support Partial Extension	9	4	13
ALTERNATIVES			
Terminate Highway 407 at McCowan Road (temporarily)	5	-	5
Terminate Highway 407 at Highway 404 (temporarily)	1	-	1
Terminate Highway 407 at McCowan Road (permanently)	1	-	1
Terminate Highway 407 at Highway 404 (permanently)	1	1	2
Extend Highway 407 to Durham Road 23	-	4	4
Extend Highway 407 to N/S link to Highway 401	-	1	1
Extend Highway 407 to Highway 401 via Taunton Road	2	-	2
Extend Highway 407 to Highway 35/115	-	1	1
MARKHAM ROAD (Highway 48)			
No interchange at Markham Road	11	-	11
South access only at Markham Road	7	-	7
Full interchange at Markham Road	1	-	1
Concerned with truck traffic on Markham Road	6	-	6

HIGHWAY 407 PARTIAL EXTENSION

SUMMARY OF WRITTEN COMMENTS RECEIVED AT AND FOLLOWING PUBLIC CONSULTATION SESSIONS November 6 & 7, 1996

Page 2

	Nov. 6/96	Nov. 7/96	Total
NOISE CONCERNS			
General	9	2	11
At Markham Road	2	-	2
At Colonel Butler Drive	4	-	4
At 9th Line	3	-	3
In Brooklin Area	-	1	1
NATURAL ENVIRONMENT			
General	7	8	15
Rouge River Valley	4	-	4
Woodlots	1	-	1
Wildlife	3	-	3
Farmland	5	-	5
Air Pollution	2	-	2
Robinson Creek	1	-	1
Wetland Complex	1	-	1
SMALL COMMUNITIES			
Brougham	-	5	5
Greenwood	-	3	3
Box Grove	2	-	2
REGIONAL OR MUNICIPAL ROADS			
Steeles Avenue (widening?)	1	2	3
9th Line (traffic increase?)	2	-	2
McCowan Road (improvements?)	1	-	1
Kennedy Road (improvements?)	1	-	1
Taunton Road (widening?)	-	3	3
Brock Road (realignment?, widening?)	1	3	4
Highway 7 (traffic volumes?)	-	2	2

HIGHWAY 407 PARTIAL EXTENSION

SUMMARY OF WRITTEN COMMENTS RECEIVED AT AND FOLLOWING PUBLIC CONSULTATION SESSIONS November 6 & 7, 1996

Page 3

	Nov. 6/96	Nov. 7/96	Total
Lakeridge Road (possible link to Highway 401?)	-	1	1
Salem Road (traffic volumes?)	-	1	1
OTHER COMMENTS / CONCERNS			
Urban sprawl	3	-	3
9th Line Interchange (for and against)	5	-	5
North / south links to Highway 401	1	-	1
Too many interchanges	3	1	4
Transit should be the first priority	3	2	5
Lighting	1	-	1
Noise barriers	2	-	2
Increased traffic on Highway 7 (east of Brock Road)	-	2	2
Brock Road interchange	-	4	4
Costs, who will finance?	3	-	3

**ONTARIO GOVERNMENT NOTICE****HIGHWAY 407 PARTIAL EXTENSION
ENVIRONMENTAL ASSESSMENT STUDY**

Highway 407 west of Markham Road is now under construction and is planned to open in 1998. In early 1996, the Ministry of Transportation assessed traffic conditions anticipated at the time of the planned opening. In consideration of input received from affected stakeholders and the public, the need for an extension of Highway 407 east of Markham Road to address these anticipated conditions was also assessed.

Further to the earlier work, the Ministry of Transportation (MTO) is now preparing an Environmental Assessment for a Partial Extension of Highway 407 from Markham Road easterly to the Brock Road / Highway 7 area. The subject area is shown on the key plan (see back). The MTO intends to complete and submit an Environmental Assessment Report to the Ministry of Environment and Energy by the end of 1996. The preparation of the Environmental Assessment includes the completion of technical negotiations with stakeholder agencies and further public consultation.

Two Public Consultation Sessions are scheduled to review the study findings to date and to solicit further public input:

WEDNESDAY, NOVEMBER 6, 1996**6:00 - 9:00 p.m.**

**MARKHAM VILLAGE COMMUNITY CENTRE
6041 Highway 7
(SE corner of Hwy 7
and Markham Road)
Town of Markham**

THURSDAY, NOVEMBER 7, 1996**6:00 - 9:00 p.m.**

**KAHN AUCTION BARN
2699 Brock Road North
(between Rossland Rd and Taunton Rd)
Town of Pickering**

(Please note that the Kahn Auction Barns location is wheelchair accessible, but the Markham Village Community Centre is not.)

These will be informal drop-in sessions where Ministry staff and consultants will be available to discuss the study, answer questions and receive your comments. Anyone with an interest in the study is urged to attend.

This study is being carried out in accordance with the requirements of the Environmental Assessment Act.

FOR FURTHER INFORMATION, PLEASE CONTACT:

Ms. Denise Morneau, P. Eng.
Ministry of Transportation
3rd Floor, Atrium Tower
1201 Wilson Avenue
Downsview, Ontario M3M 1J8

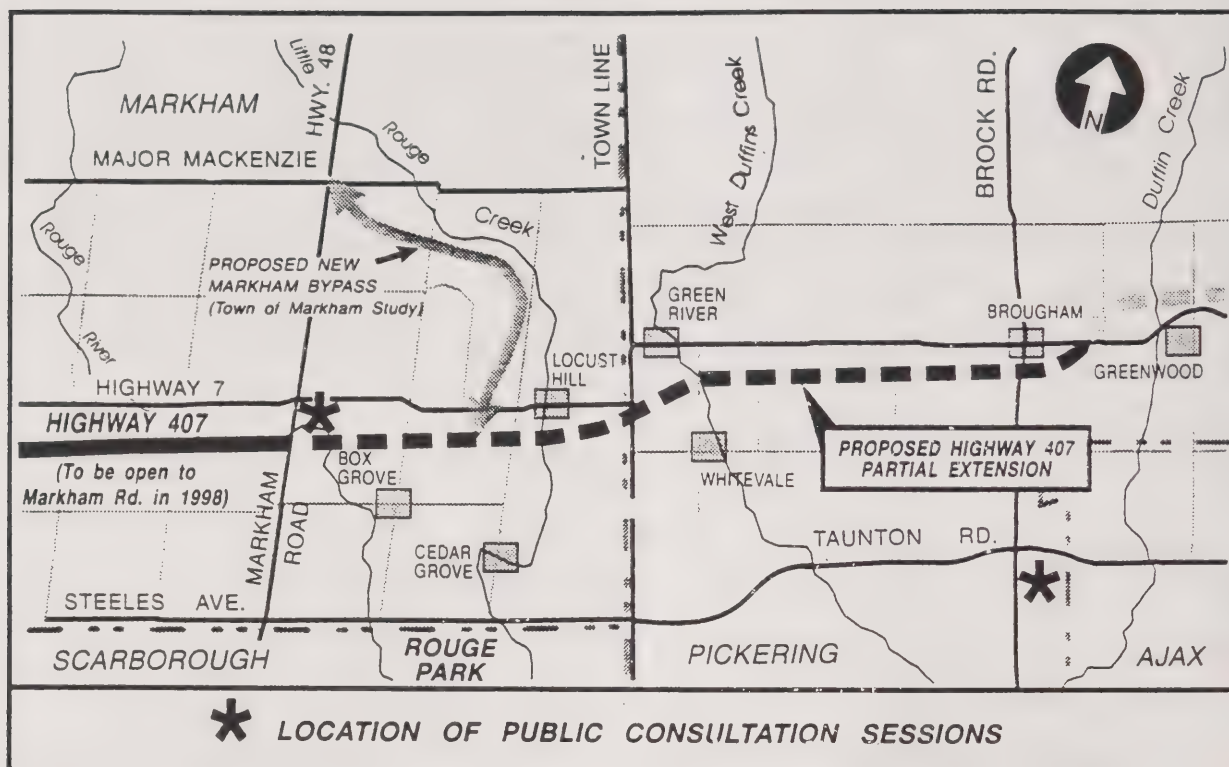
Phone: (416) 235-5489
Fax: (416) 235-4940

Mr. John Sutherns, P. Eng.
McCormick Rankin
2655 North Sheridan Way
Mississauga, Ontario
L5K 2P8

Phone: (905) 823-8500
Fax: (905) 823-8503

With the exception of personal information, all comments will become part of the public record.

KEY PLAN




WEDNESDAY, NOVEMBER 6, 1996

6:00 - 9:00 p.m.

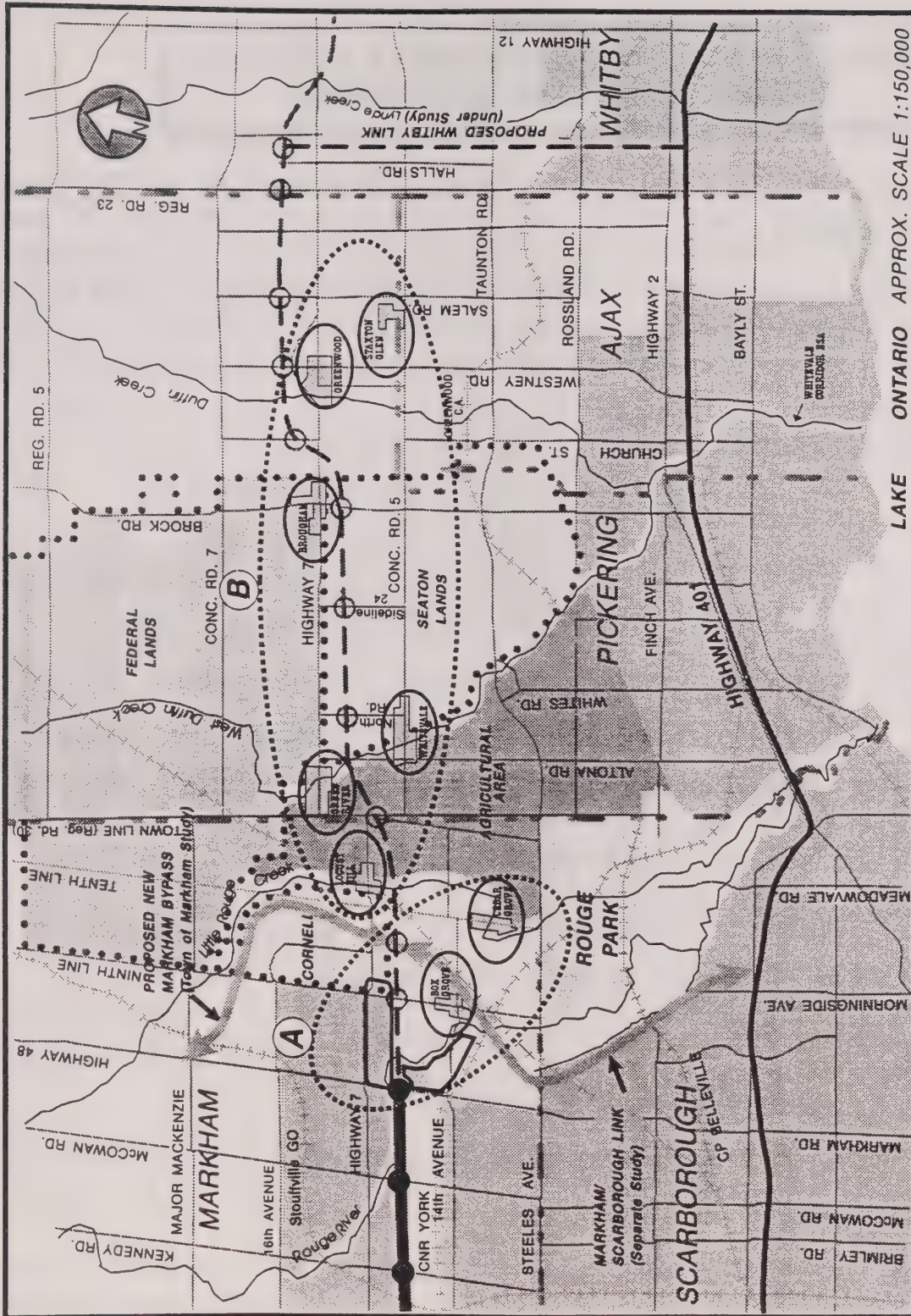
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LAKE ONTARIO APPROX. SCALE 1:150,000

MAILING AREAS

LEGEND

-  HIGHWAY 407 CENTRAL
(To be constructed to Highway 48 by 1998)
-  PROPOSED HIGHWAY 407 EAST/TRANSIT
(Technically preferred route)
-  PROPOSED INTERCHANGES

Brochures delivered to
areas outlined in black

-  A - Markham Post Office
-  B - Locust Hill Post Office



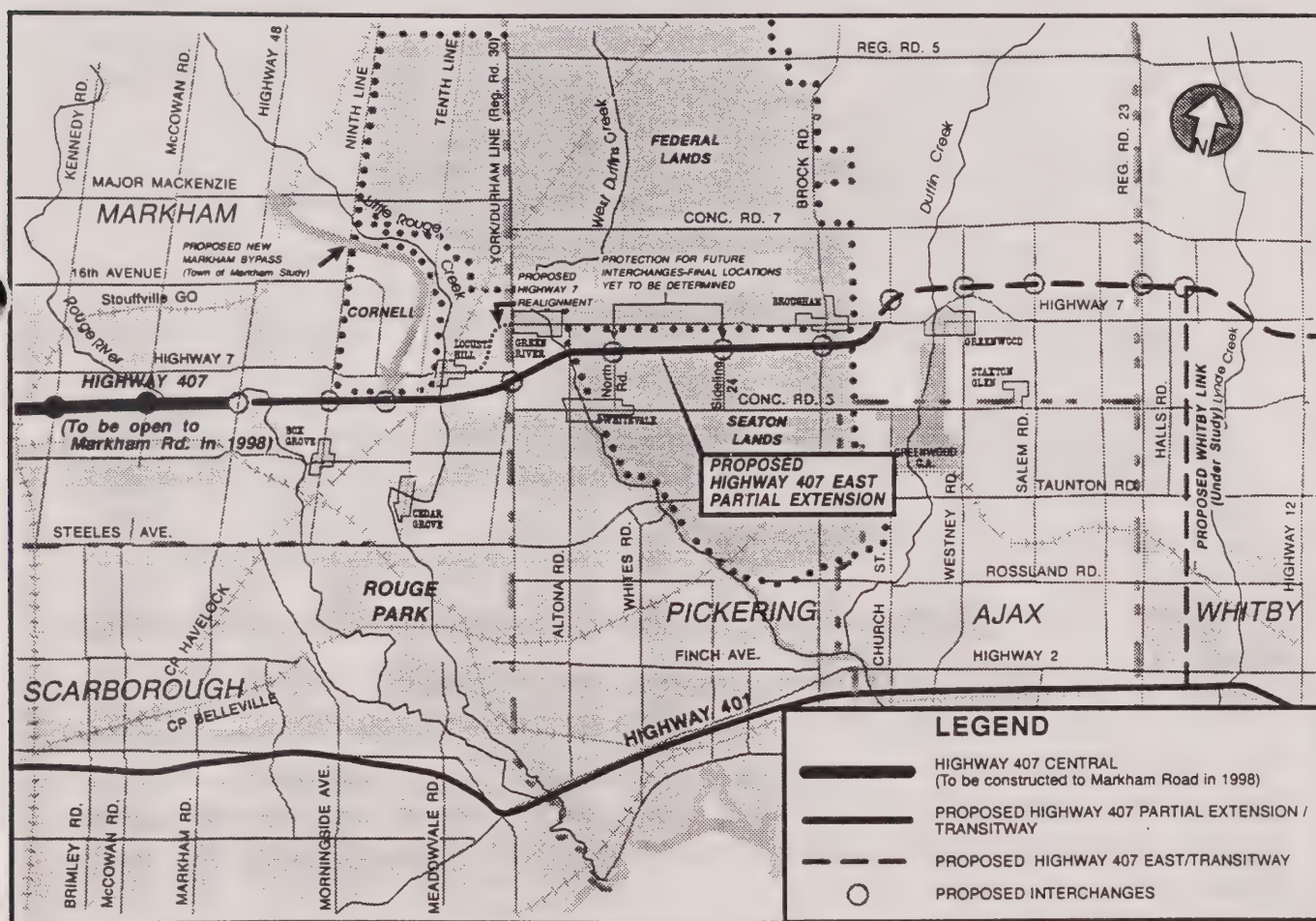
**DISPLAY PANELS FOR NOVEMBER 6 AND 7, 1996
PUBLIC CONSULTATION SESSIONS**

PANELS

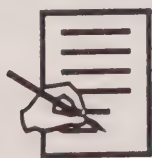
- INTRODUCTION
- OVERALL HIGHWAY 407
- HIGHWAY 407 EAST /
SYSTEM PLANNING
- ROUTE PLANNING
- FEASIBILITY STUDY
- FEASIBILITY STUDY - PUBLIC COMMENTS
- FEASIBILITY STUDY - FINDINGS
- ENVIRONMENTAL ASSESSMENT SUBMISSION
- PROPOSED PARTIAL EXTENSION
 - 1:10,000 Mosaic (2 copies of panel)
 - 1:10,000 Preliminary Plan Plates
- BENEFITS AND EFFECTS
- STAKEHOLDER CONSULTATION PROCESS
- NEXT STEPS
- STANDARD MTO PANELS RE:
 - Freedom of Information Requirements
 - Aggregates

INTRODUCTION

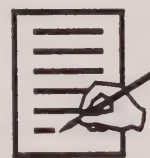
Highway 407 west of Markham Road is now under construction. Earlier this year the Ministry assessed the feasibility of "fast-tracking" an extension of Highway 407 east of Markham Road as a way of dealing with traffic concerns related to the planned 1998 opening of Highway 407 to Markham Road. Based on the study findings and input received from affected stakeholders and the public, the Ministry is now preparing an Environmental Assessment for Highway 407 from Markham Road easterly to Highway 7 east of Brock Road.



This Public Consultation Session has been arranged to obtain public comment and input regarding the study findings to date.

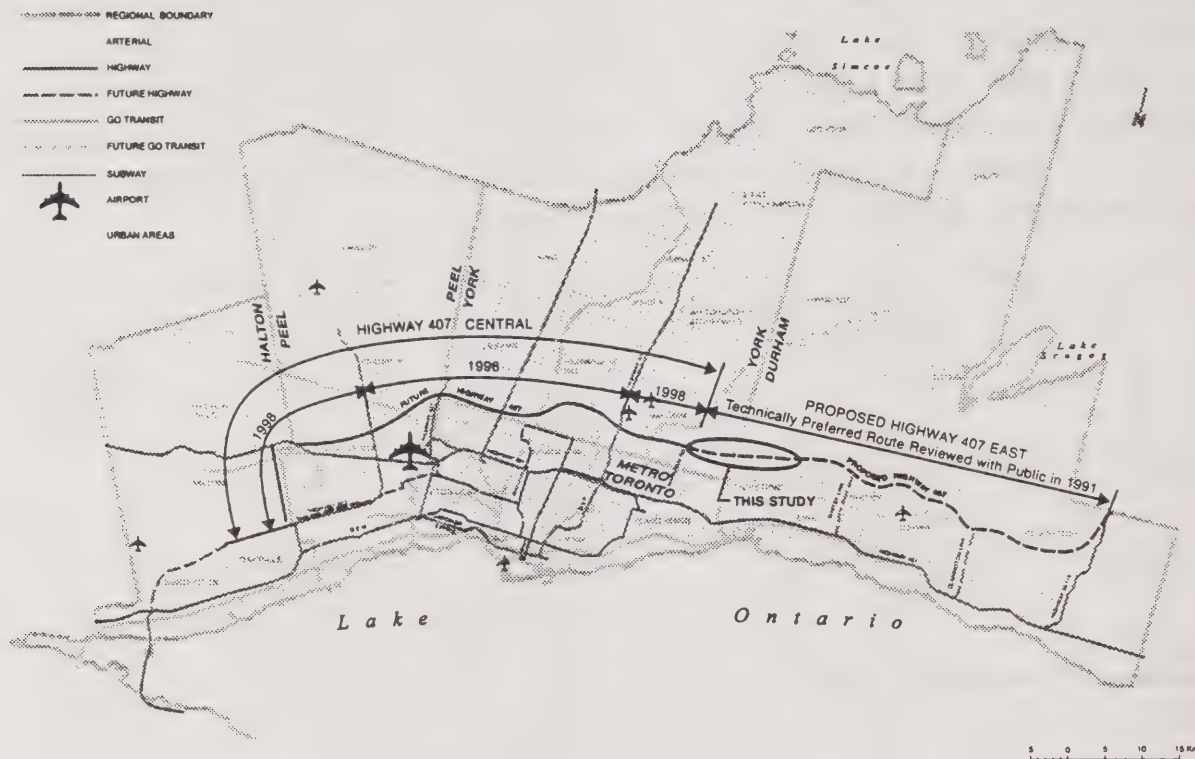


**PLEASE REVIEW THE INFORMATION,
DISCUSS WITH STUDY STAFF AND
PROVIDE ANY COMMENTS ON THE
SHEETS PROVIDED.**





OVERALL HIGHWAY 407



- The concept of Highway 407 was initially considered during the 1940's and 1950's.
- A corridor, located within the Parkway Belt, was subsequently identified west of Markham Road.
- In 1989, the province completed an overview study which identified the need to extend Highway 407 east of Markham Road to Highway 35/115 including two links with Highway 401. Therefore, east of Markham Road, the province commenced route planning in 1989, which is still underway. The technically preferred route for Highway 407 east of Markham Road was reviewed with the public in 1991.
- In 1993, the province announced the funding for the acceleration of Highway 407 construction west of Markham Road. Subsequently in May 1994, the province announced a contract to develop, design and build Highway 407 from Highway 403 in Mississauga to Markham Road in Markham.

Highway 407 is planned to open to Markham Road in 1998. In early 1996, the province carried out a feasibility study to assess traffic conditions anticipated at the time of the planned opening.



HIGHWAY 407 EAST

The studies related to proposed Highway 407 East of Markham Road include:

PHASE	SYSTEM PLANNING	ROUTE PLANNING	FEASIBILITY STUDY	EA SUBMISSION	DESIGN / IMPLEMENTATION
PRODUCT	IDENTIFICATION OF NEED	TECHNICALLY PREFERRED ROUTE	PARTIAL EXTENSION TO BROCK ROAD	REQUEST FOR EA APPROVAL	DESIGN / CONSTRUCTION
TIMING		1989-1993	1995-1996	1996	
PUBLIC CONSULTATION		*	*	*	*

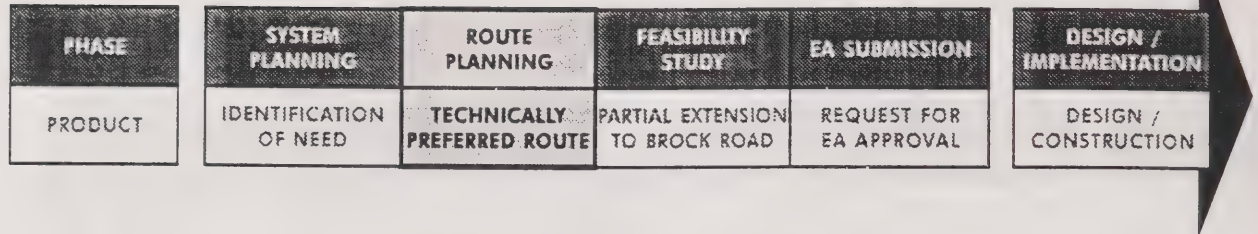
SYSTEM PLANNING

PHASE	SYSTEM PLANNING	ROUTE PLANNING	FEASIBILITY STUDY	EA SUBMISSION	DESIGN / IMPLEMENTATION
PRODUCT	IDENTIFICATION OF NEED	TECHNICALLY PREFERRED ROUTE	PARTIAL EXTENSION TO BROCK ROAD	REQUEST FOR EA APPROVAL	DESIGN / CONSTRUCTION

- In 1989 the Ministry completed an overview study which reconfirmed the need for Highway 407 from Markham Road to Highway 35/115 to:
 - support future growth in Durham Region
 - serve future east-west travel demands and provide additional traffic capacity
- The study also concluded that two connecting links between future Highway 407 and Highway 401 are required as part of the overall transportation network.
- Due to pressures for development in Durham Region, the study identified an immediate need to protect for these transportation corridors.



ROUTE PLANNING

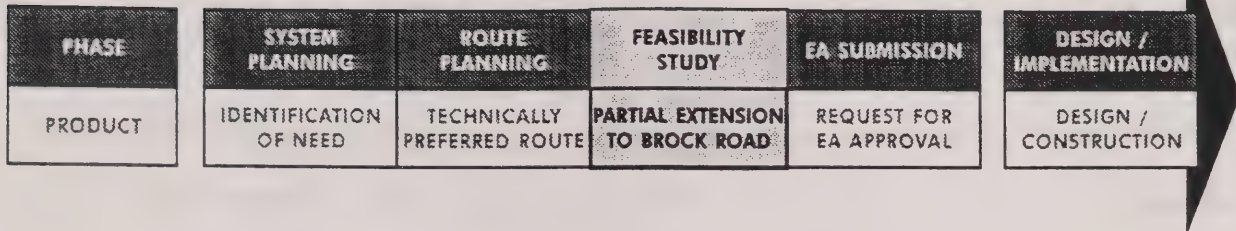


- In response to the recommendations from the Overview Study, the Ministry initiated a Route Planning Study which was carried out in early 1990's to establish a preferred route for Highway 407 between Markham Road and Highway 35/115 and an adjacent transitway from Markham Road to the Clarington Link.
- Extensive consultation with the public, interest groups, agencies and municipalities was an important part of the study. Public Consultation Sessions were held in 1990 and 1991.
- A number of route alternatives were identified and evaluated for the following:
 - natural environment
 - social environment
 - cultural environment
 - agriculture
 - economic environment
 - transportation and engineering
- A "technically preferred route" for proposed Highway 407 and an adjacent transitway, was determined and reviewed with the public in 1991. As a result of comments received, the route was subsequently refined in two locations.
- The planning for Highway 407 to Highway 35/115 and the links is still ongoing.

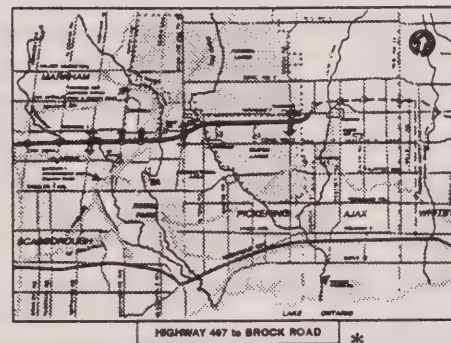
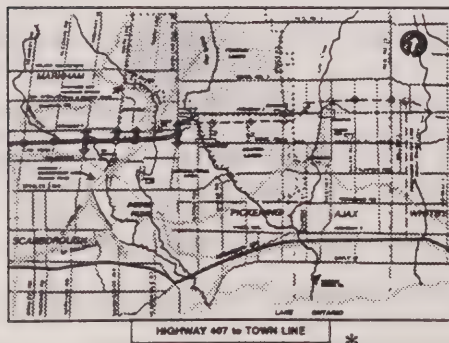
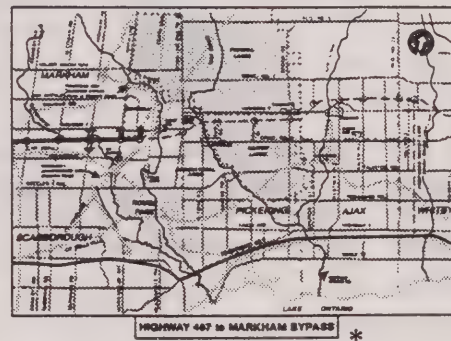
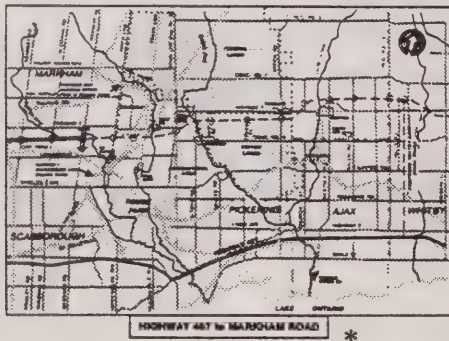
Key plan showing technically preferred route including alignment shifts



FEASIBILITY STUDY



- Earlier this year, the Ministry evaluated the feasibility of implementing a "Partial Extension" of Highway 407 east of Markham Road as a way of dealing with traffic concerns related to the planned 1998 opening of Highway 407 to Markham Road.
- Four extension options were considered, along the technically preferred route: which was established earlier and generally accepted.



* as reviewed with the public in April 1996

These options were reviewed with the public and other stakeholders in March/April 1996.



**FEASIBILITY STUDY
PUBLIC COMMENTS**

- Public Consultation Sessions were held on April 3, 1996 (Markham) and April 4, 1996 (Pickering)
- Over 300 people attended and more than 100 provided written comments
- Summary

Markham

- Approximately 215 attended
- Written comments were received from 76 attendees

The main comments were:

- Markham Road is too busy and congested now
- Need to protect/maintain/enhance Old Markham
- Concern about Highway 407 terminating at Markham Road
- Environmental sensitivity associated with Rouge River and valley
- The extension of Highway 407 to the Markham Bypass as a minimum was supported by the majority of attendees.
- A common concern raised both on the comments sheets and in discussion with attendees was the perceived negative impact to Old Markham if access to and from Markham Road north of Highway 407 was permitted, even with Highway 407 extended further east. A number of attendees requested that access to and from Markham Road north of Highway 407 be restricted.

Pickering

- Approximately 100 attended
- Written comments were received from 24 attendees
- Many attendees were involved in the earlier route planning study and exhibited a general recognition and/or acceptance of the extension of Highway 407 from Markham Road to Highway 35/115. A number of people expressed support for the continuation of Highway 407 east of Markham Road through Durham.
- The main focus of the comments received was on the status and timing of the entire Highway 407 East project, from Markham Road to Highway 35/115, and the two connecting links to Highway 401.
- Many expressed concern with the existing levels of traffic through the existing hamlets/communities.
- Many expressed the need to 'get on with it' in order to terminate the general uncertainty in the area.
- A number of attendees enquired about property issues and requested information about MTO's process for acquiring property.
- The need for a Highway 401/407 link in this area (east Markham/west Pickering) was identified by a number of people.
- A number of residents in Whitevale expressed their concern with traffic volumes through the hamlet.



FEASIBILITY STUDY FINDINGS

- The four options were evaluated on the basis of:
 - their effectiveness in addressing the identified traffic concerns
 - their financial feasibility
 - the comparative analysis of environmental effects
 - their ability to reduce traffic impacts to local communities
 - comments/preferences of the review agencies, municipalities and the public:

Agencies - all extensions are acceptable subject to provision of appropriate mitigation

Markham/York - extension to Markham Bypass as a minimum is strongly preferred

Pickering/Durham - extension to Brock Road as a minimum is strongly preferred

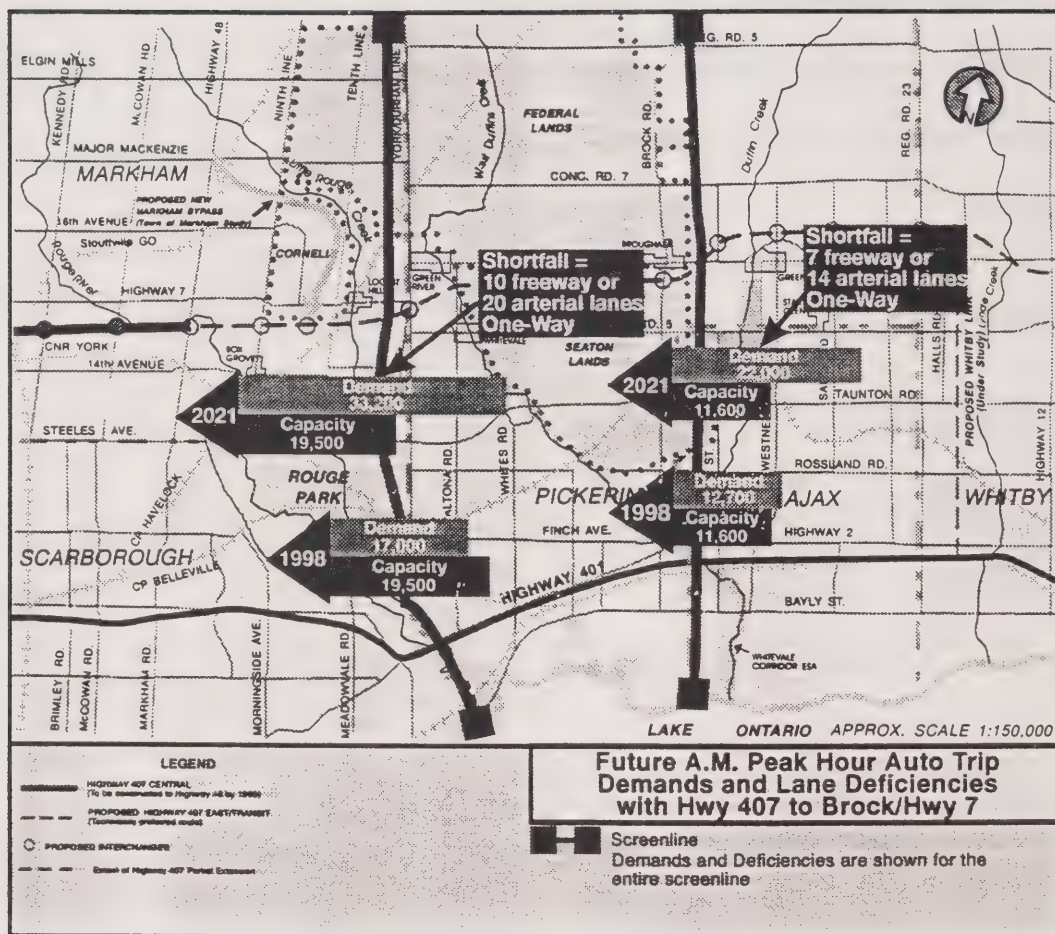
Public - extension, to Markham Bypass as a minimum, is strongly preferred

Findings

- Confirmation of traffic impacts on area road network with opening of Highway 407 to Markham Road.
- Overall recognition of problem by public and municipalities
- Concerns about potential effects on environmental features associated with crossings of major watercourses. Mitigating measures will be applied in order to reduce effects (see following panel).
- Extension to Brock Road / Highway 7 :
 - best distributes traffic on area road network
 - best minimizes impacts on existing communities
 - is generally supported by the public and municipalities

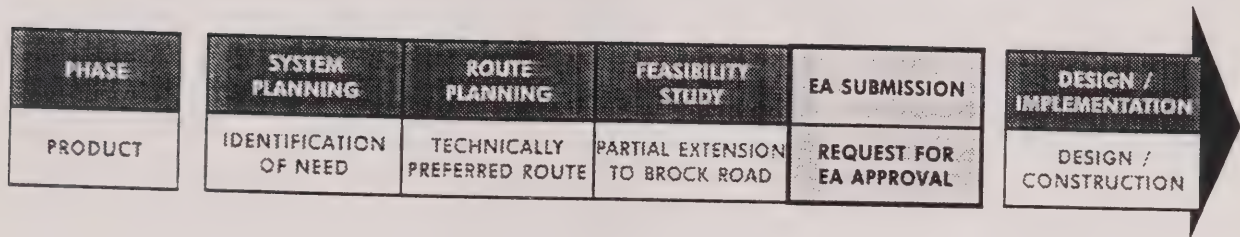
Considering all of the foregoing, approval is being sought for the partial extension/transitway of Highway 407 to Highway 7 east of Brock Road including the realignment of Highway 7 west of the York/Durham Line.

TRAFFIC ANALYSIS





**ENVIRONMENTAL ASSESSMENT
SUBMISSION**



- The Ministry is proposing to submit an Environmental Assessment Report by the end of 1996 to the Ministry of Environment and Energy for review and approval.
- The main components of this phase are:
 - consultation regarding the proposed Highway 407 Partial Extension
 - identification of the main benefits and effects
 - outlining stakeholder consultation and environmental mitigation processes to be followed during the design and construction of the project
 - preparing an Environmental Assessment Report



PROPOSED PARTIAL EXTENSION

- 1:10,000 Mosaic (2 copies)
- 1:10,000 Preliminary Plan and Profile Plates



BENEFITS AND EFFECTS

- Insert attached

**HIGHWAY 407/TRANSITWAY - MARKHAM ROAD TO HIGHWAY 7 EAST OF BROCK ROAD
POTENTIAL ENVIRONMENTAL EFFECTS AND PROPOSED MITIGATION**

FACTOR	POTENTIAL ENVIRONMENTAL EFFECTS	PROPOSED MITIGATION/FUTURE ACTION
NATURAL ENVIRONMENT		
WATER COURSE CROSSINGS	<ul style="list-style-type: none"> • Crosses Rouge, Little Rouge and West Duffins and their tributaries (locations chosen to minimize impacts) • Crosses tributaries of Petticoat Creek • Potential realignment/channelization • Placement of piers in watercourses • Potential effects on flood levels upstream of crossings 	<ul style="list-style-type: none"> • Commitment to ongoing stakeholder consultation re: the environmental issues/mitigation during design of each crossing • Commitment to span Rouge, Little Rouge and West Duffins watercourses and investigate alternatives at other crossings based on environmental sensitivities identified during design. • No bridge piers will be placed in the water • Minimize watercourse and vegetative impacts during design • Open bottom culverts will be investigated for use in upwelling areas • Natural channel design will be investigated for use where stream diversions are required • Flood risk will be minimized through design
FISHERIES	<ul style="list-style-type: none"> • Alteration of fish habitat • Blockage of migratory fish passage • Effects on rare/endangered species (none found at crossings) 	<ul style="list-style-type: none"> • Studies done to identify sensitive fisheries in accordance with MNR & DFO requirements. • Bridges proposed at Rouge, Little Rouge and West Duffins • All crossings will be assessed and designed in consultation with MNR, DFO, MTRCA • Will develop fishery protection plans with MNR and DFO • Construction timing will avoid spawning periods • Avoid/minimize alteration to watercourses

FACTOR	POTENTIAL ENVIRONMENTAL EFFECTS	PROPOSED MITIGATION/FUTURE ACTION
WATER QUALITY	<ul style="list-style-type: none"> • Runoff water quality impacts on surface and ground water • Runoff water quantity impacts on stream erosion, sedimentation and flooding • Impact on upwelling areas in watercourses 	<ul style="list-style-type: none"> • Stormwater management measures will be implemented to control runoff impacts • Erosion control program will ensure that construction impacts on water quality are controlled • Upwelling areas within watercourses will be protected through the use of open bottomed culverts • Flood risk will be minimized during design
WETLANDS	<ul style="list-style-type: none"> • Loss of wetland function • Loss of wetlands 	<ul style="list-style-type: none"> • Drainage will be maintained in support of wetland functions • Provincially significant wetlands have been avoided through planning
VEGETATION	<ul style="list-style-type: none"> • Impacts on ESAs • Vegetation removals and severances • Loss of riparian vegetation at crossings • Effects on rare/endangered species (none identified) 	<ul style="list-style-type: none"> • Minimizes impacts to the Whitevale ESA • Most significant areas avoided • Woodland severances will be minimized during design • Bridges will reduce vegetation impacts at major valley crossings • Riparian vegetation will be maintained/re-established
WILDLIFE	<ul style="list-style-type: none"> • Loss of wildlife habitat • Effects on wildlife corridors • Effects on rare/endangered species (none identified) 	<ul style="list-style-type: none"> • Commitment to consult with stakeholders re: environmental issues/mitigation during design • Vegetation removals will be minimized • Bridges will be designed to maintain wildlife corridors • Riparian vegetation will be maintained/re-established

FACTOR	POTENTIAL ENVIRONMENTAL EFFECTS	PROPOSED MITIGATION/FUTURE ACTION
SOCIAL ENVIRONMENT		
TRAFFIC IMPACTS	<ul style="list-style-type: none"> • Traffic-related impacts in local communities • Congestion on local roads 	<ul style="list-style-type: none"> • Traffic-related impacts at Markham, Box Grove, Locust Hill, Whitevale and Brougham will be reduced • Congestion will be reduced on local roads
NOISE	<ul style="list-style-type: none"> • Increased noise for residences in proximity to Hwy 407 	<ul style="list-style-type: none"> • Detailed Noise Study will be conducted and appropriate mitigating measures developed during design phase in accordance with established MTO/MOEE Noise Protocol
PROPERTY PURCHASES	<ul style="list-style-type: none"> • Purchases of residences and businesses • Property severances 	<ul style="list-style-type: none"> • Effects minimized through planning • Most of the land required is in public ownership • Property severances will be minimized during design phase. • Directly impacted properties will be purchased at fair market value
RECREATION	<ul style="list-style-type: none"> • Blockage of hiking trails in Rouge, Little Rouge and West Duffins valleys 	<ul style="list-style-type: none"> • Trails will be maintained through use of bridges over major valleys
ECONOMIC ENVIRONMENT		
ECONOMIC DEVELOPMENT	<ul style="list-style-type: none"> • Impacts on proposed land use development plans 	<ul style="list-style-type: none"> • Supports Cornell and Seaton Plans • Ongoing consultation will be carried out with community planners and municipalities
AGRICULTURE	<ul style="list-style-type: none"> • Loss of prime agricultural land 	<ul style="list-style-type: none"> • Loss of prime agricultural land reduced by crossing at a narrow point in agricultural area, and by following lot lines where possible • Land requirements and farm severances will be minimized during the design phase

FACTOR	POTENTIAL ENVIRONMENTAL EFFECTS	PROPOSED MITIGATION/FUTURE ACTION
CULTURAL ENVIRONMENT		
HERITAGE BUILDINGS	<ul style="list-style-type: none"> • Removal of historical buildings (7 former farmsteads directly affected) 	<ul style="list-style-type: none"> • Most historical buildings have been avoided • Detailed heritage assessments and mitigation will be carried out in consultation with provincial and local heritage authorities
ARCHAEOLOGY	<ul style="list-style-type: none"> • Impact on archaeological sites (1 known site may be affected) 	<ul style="list-style-type: none"> • Most archaeological sites have been avoided • Detailed archaeological assessments and mitigation will be carried out in consultation with provincial and local heritage authorities



STAKEHOLDER CONSULTATION PROCESS

Extensive consultation and analysis has identified a route that minimizes the impacts to the natural environment and local communities, and supports local economic development objectives.

The Ministry is committed to identifying further opportunities to improve the environmental design of Highway 407 by involving stakeholders in the design process.

A Stakeholder Consultation Process is being developed jointly with the affected Agencies including the Ministry of Natural Resources, the Ministry of Environment and Energy, the Metropolitan Toronto and Region Conservation Authority, and the Rouge Park Alliance.

Together, we are establishing environmental protection and consultation objectives that will form the cornerstone of the consultation and implementation processes to be followed after Environmental Assessment approval.

The key components of the process include:

AGENCIES

- Provision of detailed stream/valley information prior to developing design options for the crossings
- Regular meetings between the affected agencies and the design team to ensure that concerns are identified and addressed.

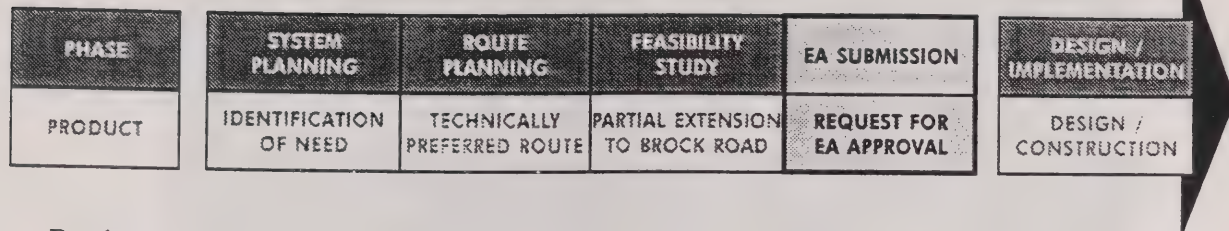
MUNICIPALITIES

- Ongoing consultation during the design phase with municipal staff to ensure that municipal objectives are met.
- Presentations to Municipal Councils as needed.

PUBLIC AND INTEREST GROUPS

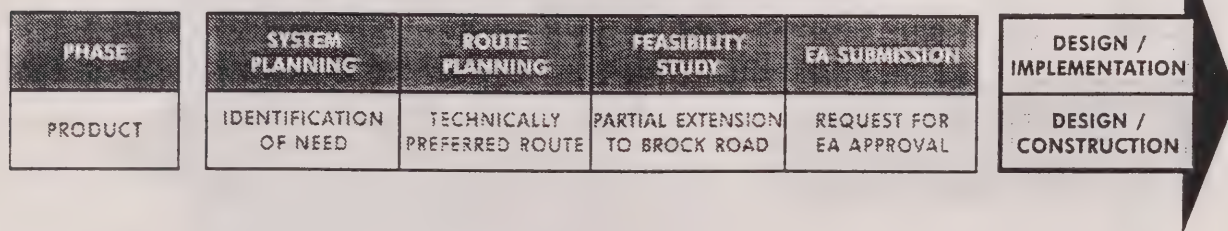
- Two Public Consultation Sessions will be held during the design phase to inform the public about the project details and obtain input to the design phase.

NEXT STEPS

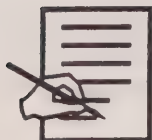


- Review public comments
- Prepare and submit Environmental Assessment Report by the end of 1996
- Minister of Environment and Energy carries out formal review and approval process

insert attached



- Complete design and implement the project
- Continue stakeholder consultation (see separate panel)



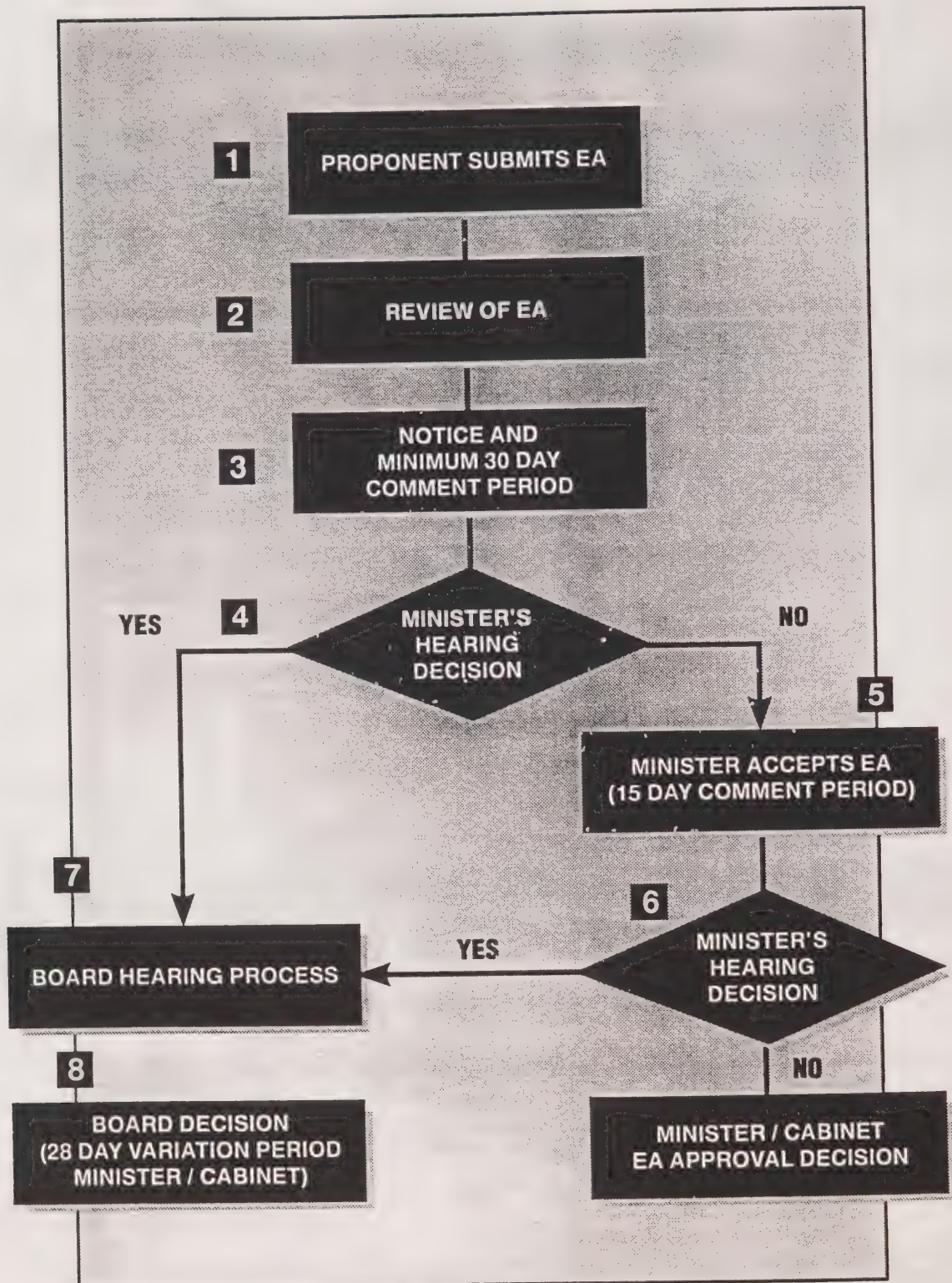
PLEASE REVIEW THE INFORMATION, DISCUSS
WITH STUDY STAFF AND PROVIDE ANY
COMMENTS ON THE SHEETS PROVIDED.



THANK YOU FOR ATTENDING

INDIVIDUAL EA REVIEW AND APPROVAL PROCESS

(CURRENTLY UNDER REVIEW)



NOTE This chart represents a simplified version of the current EA process. The process and timelines are currently under review.

SOURCE: "An introduction to EA in Ontario"



DIRECTIONS



ACTION ON HIGHWAY 407

KNOW WHERE TO STOP

HIKE ALONG PROPOSED ROUTE



JOIN A COALITION OF CITIZENS INCLUDING STUDENTS
EXPRESSING THEIR CONCERNS OVER THE COSTS AND IMPACTS
OF HIGHWAY 407 AND WALK ALONG THE PROPOSED ROUTE
FROM 9th LINE TO HWY 48 AND CROSS THE ROUGE RIVER

Sunday, November 10, 1996

1:30 pm

Meet at Box Grove United Church
14th Avenue, west of 9th Line
Markham

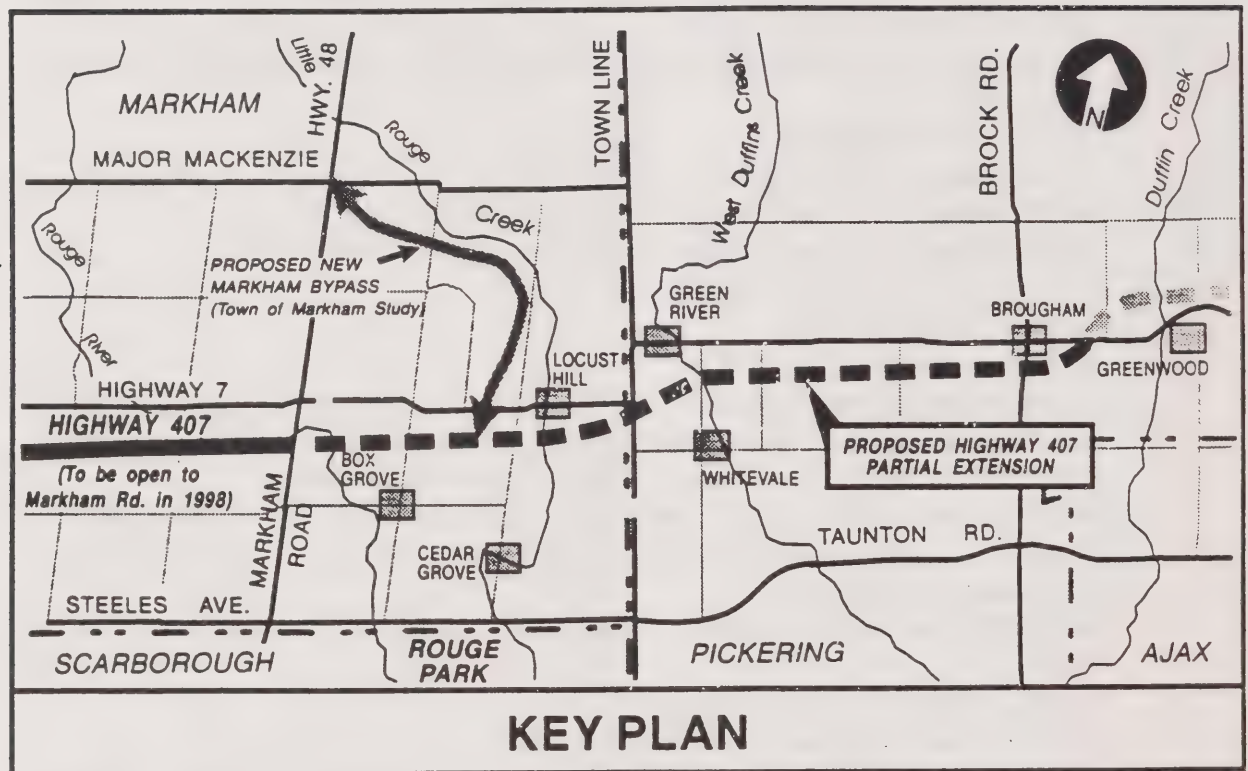
Sponsors: Friends of the Rouge, Friends of the Farewell, Friends of Second Marsh, the Green Door Alliance, 407 Highway Action Groups, Clarington Action Group, Environmentalists Plan Transportation, Coalition on Sustainable Transportation,

For further information call: in Metro (416) 284-6409, in York Region (905) 881-8453, or 887-9836., in Durham Region (905) 983-5249, (905) 436-2252, or (905) 436-2376

HIGHWAY 407 PARTIAL EXTENSION**ENVIRONMENTAL ASSESSMENT FACT SHEET****(November 1, 1996)**

-
- The Ministry of Transportation intends to seek Environmental Assessment approval for the Highway 407 / Transitway Transportation Corridor between Markham Road and Highway 7 east of Brock Road.
 - It is intended that an Environmental Assessment report will be submitted to the Minister of Environment and Energy prior to the end of 1996.
 - The Environmental Assessment will request approval for a facility including:
 - a basic minimum highway right-of-way width of 100 m, capable of accommodating a future potential 10 lane facility
 - an interchange at Markham Road that will permit moves to and from both the north and south
 - a bridge at the Rouge River
 - an interchange with 9th Line that will permit moves to and from the north only, but with protection for future potential moves to and from the south
 - an interchange with the Markham Bypass to the north of Highway 407
 - a bridge, but no access, at 10th Line
 - a bridge at the CP tracks
 - a bridge at the Little Rouge River
 - an interchange at the Durham / York Line that will permit moves to and from both the north and south. This interchange will require relocation of Highway 7 to the north between the CP tracks east of Locust Hill and Green River.
 - provision for two future interchanges between the Durham / York Line and Brock Road. The specific locations and interchange layouts will be determined as part of the planning of Seaton.
 - an interchange at Brock Road that will permit moves to and from both the north and south
 - a bridge, but no access, at Sideline 16
 - a connection to Highway 7 east of Brock Road

- The Environmental Assessment report will also seek approval for a 60 m wide transitway right-of-way on the south side of Highway 407. No date has been established for construction of the Transitway.
- The Environmental Assessment report will include a "Stakeholders Consultation Process" that will ensure that agency and public concerns are sought and reflected in the development of the detailed design and environmental mitigation plans for the highway.
- Detailed construction plans and implementation strategies for the entire Partial Extension and interchanges will be developed as part of the design of the highway if Environmental Assessment approval is granted. It is currently expected that initially only a four lane facility will be constructed.



MINISTRY OF TRANSPORTATION
HIGHWAY 407 PARTIAL EXTENSION
ENVIRONMENTAL ASSESSMENT STUDY

Public Consultation Session - Wednesday, November 6, 1996

Transcript of comments written on flip charts:

- **Page 1**

- "It should be made very clear to the public whether possible extensions would be completed before 1998 opening."

"ECHO"

- "I agree with the above! Very, very clear!"
- "Extensions should be completed before 1998 opening - should not stop at Markham Road."

"ECHO"

- **Page 2**

- "The continued destruction of good food growing lands is immoral."
- "OLD THINK! Planning for the 60s."
- "Noise concerns primarily!"
- "More impacts than benefits?"
- "Noise impact on study proposed extension to Highway 48 be undertaken immediately and given to the public."
- "With the environmental stress put on our environment every day, what is going to happen now?"

- **Page 3**

- "There is no vision here."
- "To this Government, TTC means 'Take The Car'."
- "Extending 407 east of Markham Road will have no effect on traffic on Markham Road."
- "Why would there be?"
- "The 401 - 407 link in Oshawa will be going right through a wetland (a very large one) and will have detrimental effects to Second Marsh - a protected area."

A copy of a sheet by "Action on Highway 407" group was made available by others and is attached.

MINISTRY OF TRANSPORTATION

HIGHWAY 407 PARTIAL EXTENSION
ENVIRONMENTAL ASSESSMENT STUDY

Public Consultation Session - Thursday, November 7, 1996

Transcript of comments written on flip charts:

- **Page 1**

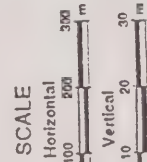
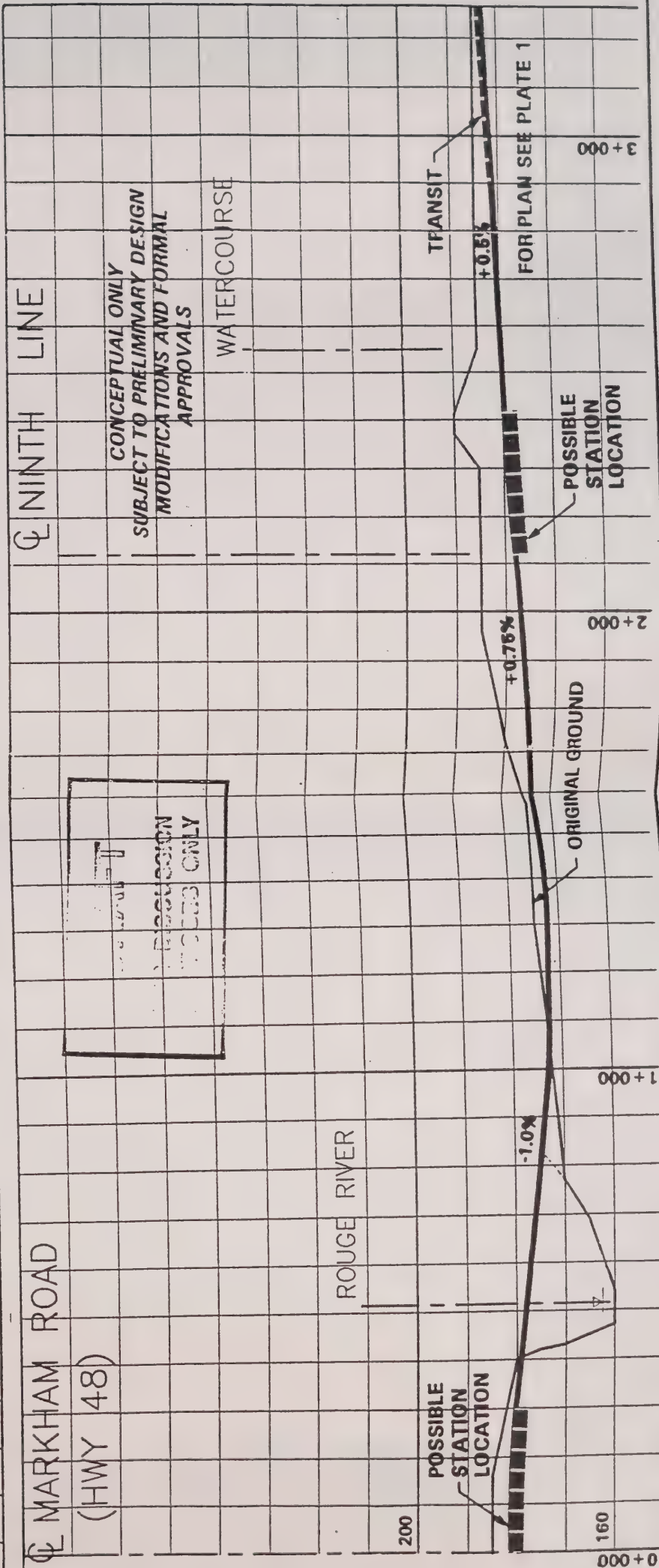
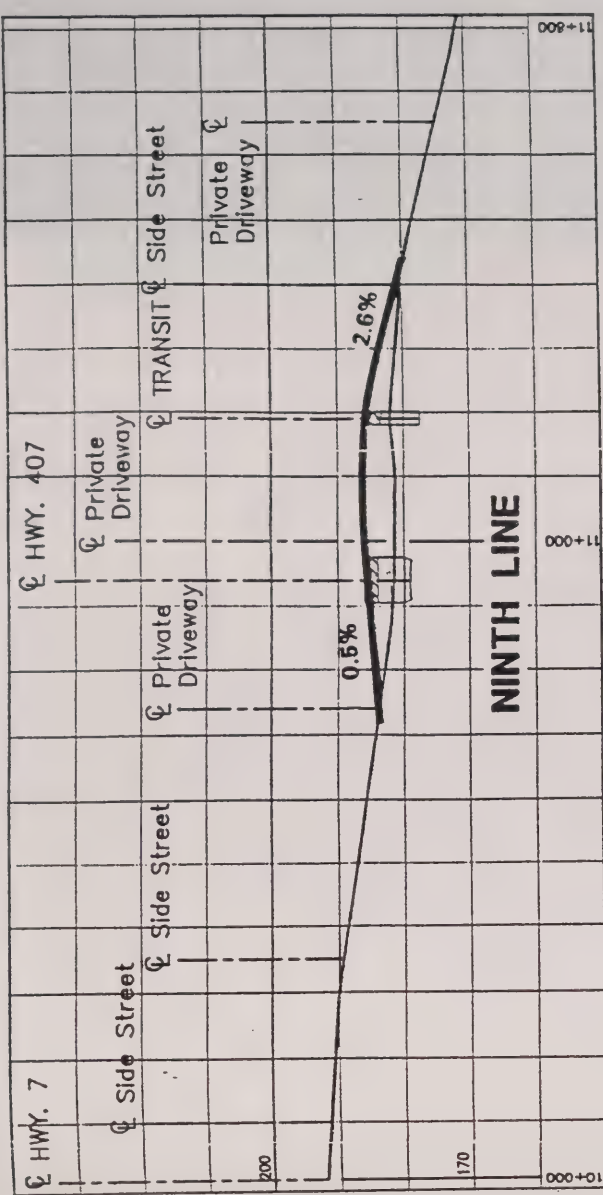
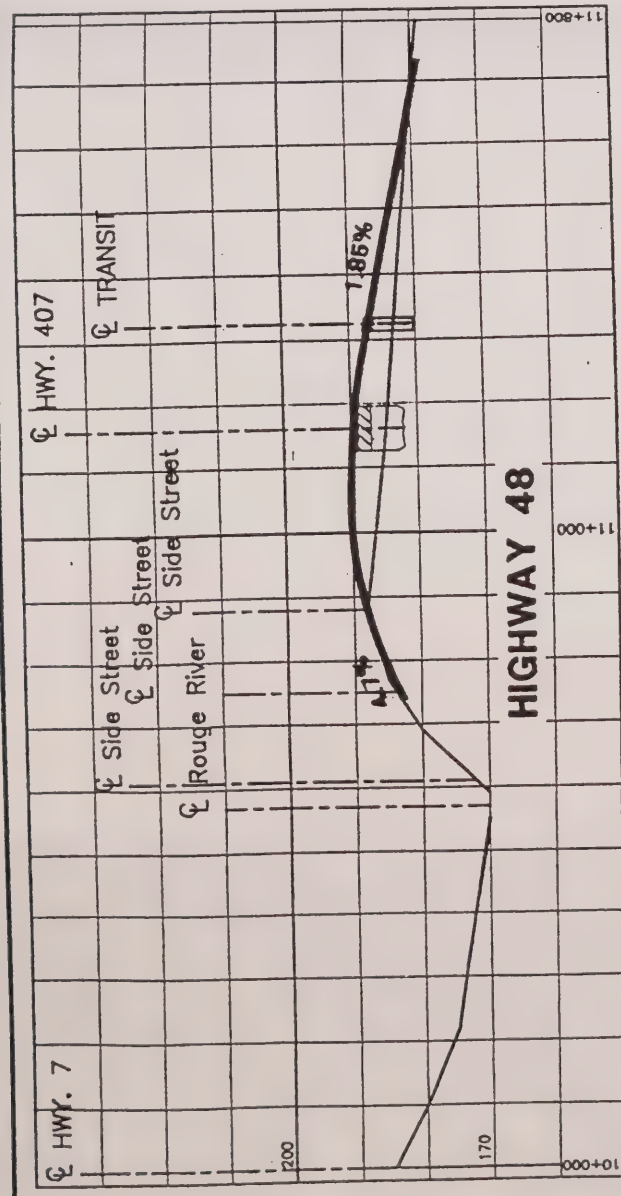
- "1.) Stop at 407 and 404 and make assessment:
 - a) Does it pay?
 - b) Is it worth to destroy environment?
 - c) Is it helping community?
 - d) Does it bring business?
 - e) Is it only way of residential development?
- 2.) Who and how much will pay?
Taxpayers always get stuck with bills, 407??
- 3.) Isn't it better to look at other options?
 - a) GO train and mass transport
 - b) Creating more jobs in our communities - not requiring 407??
- 4.) Is it environmentally sustainable project?
- 5.) Is it a political rather than common sense brain creation
1950 - cave man plans?"

- **Page 2**

- "1.) Assess usage of 407 from Highway 10 to Highway 404 for a period of at least 1 year before proceeding with an extension to Brock will address need and economic viability.
- 2.) Study noise pollution and air pollution in operating segment."
- "Why are there so many interchanges planned in such a short distance?
(Brock Road, SL14, Westney, Salem)
Population does not warrant."
- "Where is the proposed redirection of Westney Road, to Bypass Greenwood? (Town of Pickering presented in a community meeting in October 1995)?"

- **Page 3**

- "Where is the Bypass on Brock Road around Brougham?"



HIGHWAY 407 / TRANSITWAY
 MARKHAM ROAD EASTERLY TO
 HIGHWAY 7 EAST OF BROCK ROAD

TECHNICALLY PREFERRED ROUTE
 CONCEPT PROFILE

ADMISSION ONLY

MARKHAM BYPASS

Q TENTH LINE

CPR

WATERCOURSE

WATERCOURSE

WATERCOURSE

200					200
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	+0.5%
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181

[illegible] $000 + 1$ $000 + 9$

000 + 9

 $3 + 200$

FOR PLAN SEE PLATE 2

CONCEPTUAL ONLY
SUBJECT TO PRELIMINARY DESIGN
MODIFICATIONS AND FORMAL
APPROVAL'S

WATERCOURSE

LITTLE ROUGE CREEK

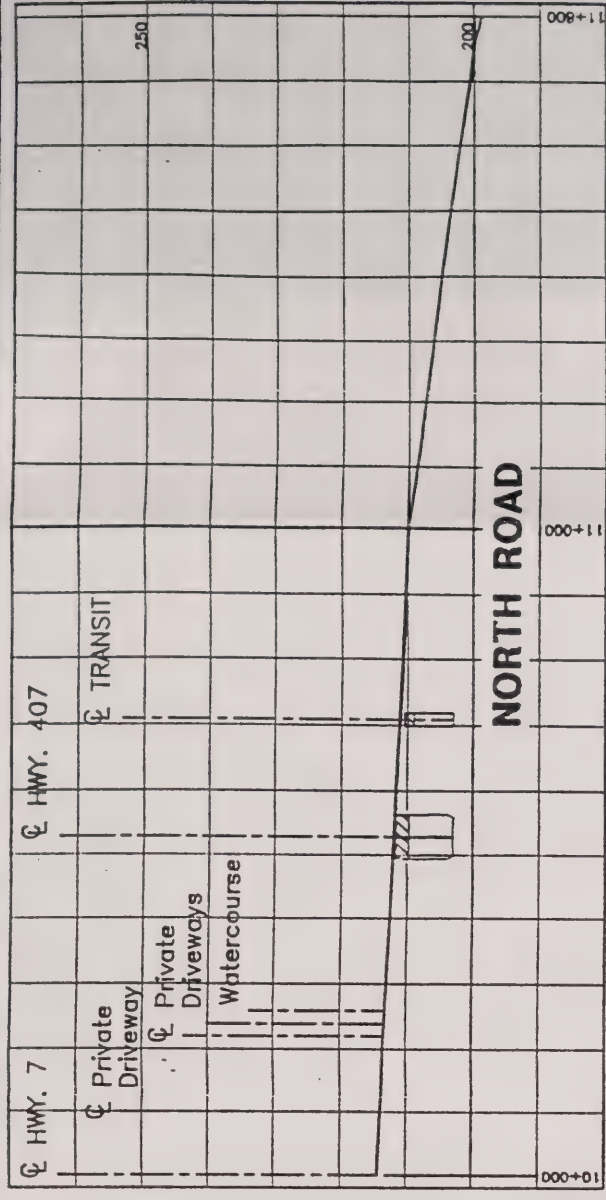
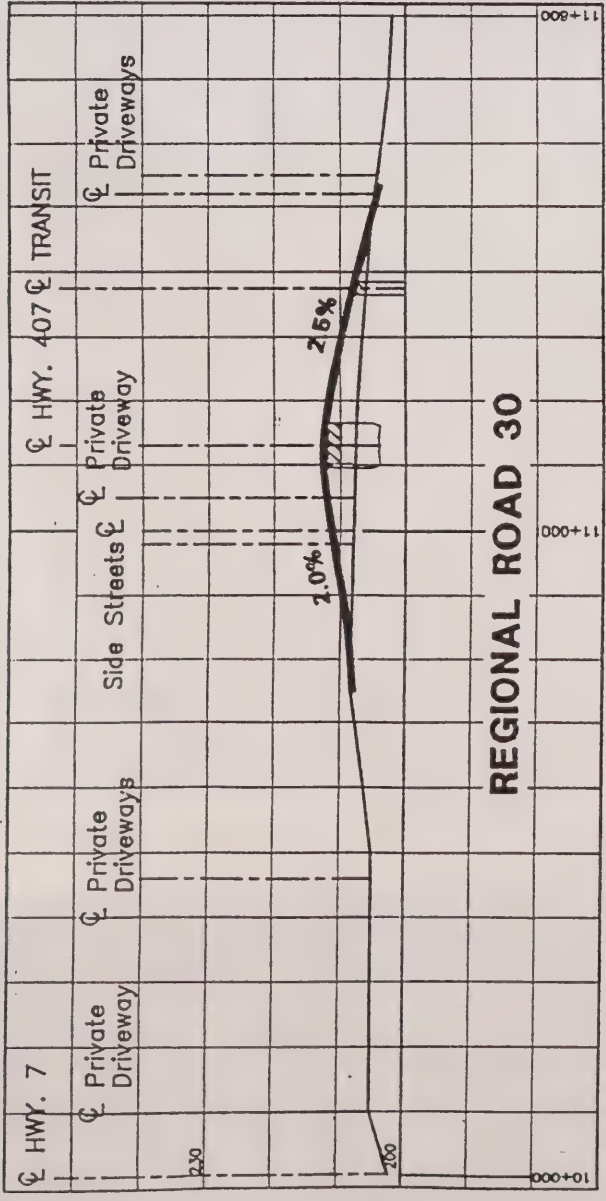
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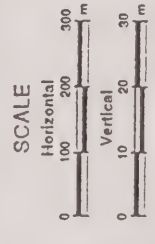
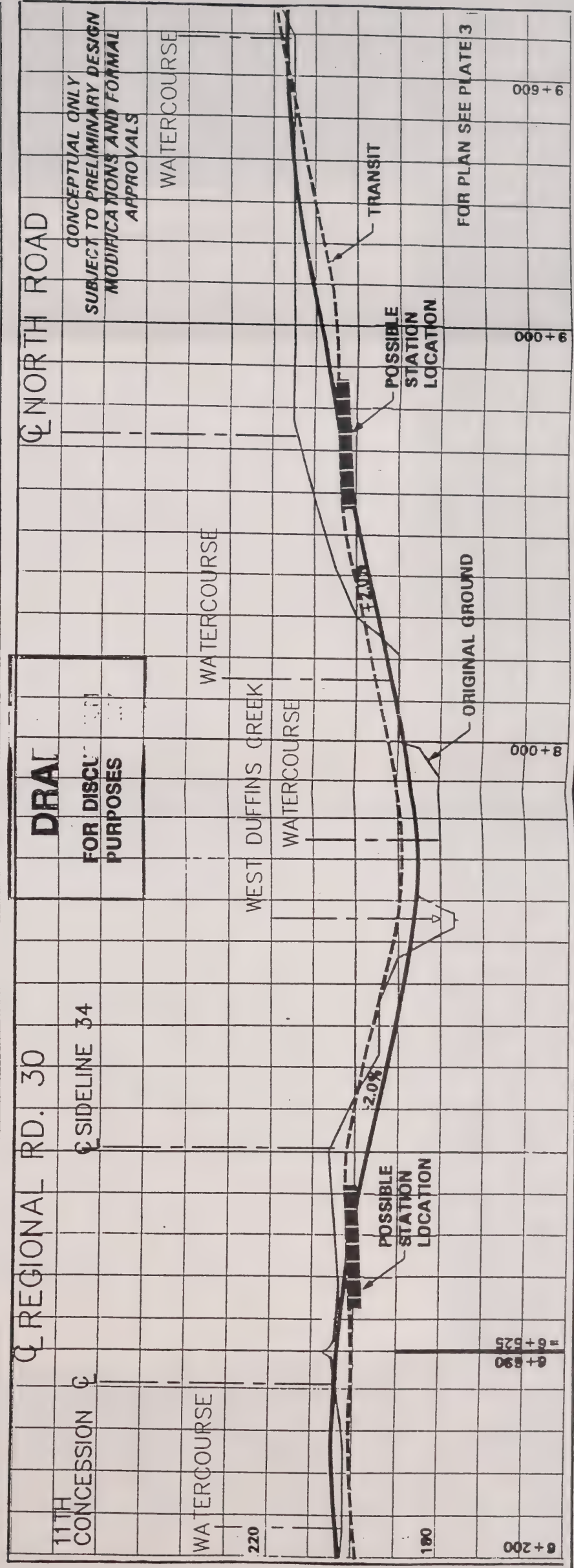
ORIGINAL GROUND

HIGHWAY 407 / TRANSITWAY
MARKHAM ROAD EASTERLY TO
HIGHWAY 7 EAST OF BROCK ROAD

TECHNICALLY PREFERRED ROUTE CONCEPT PROFILE

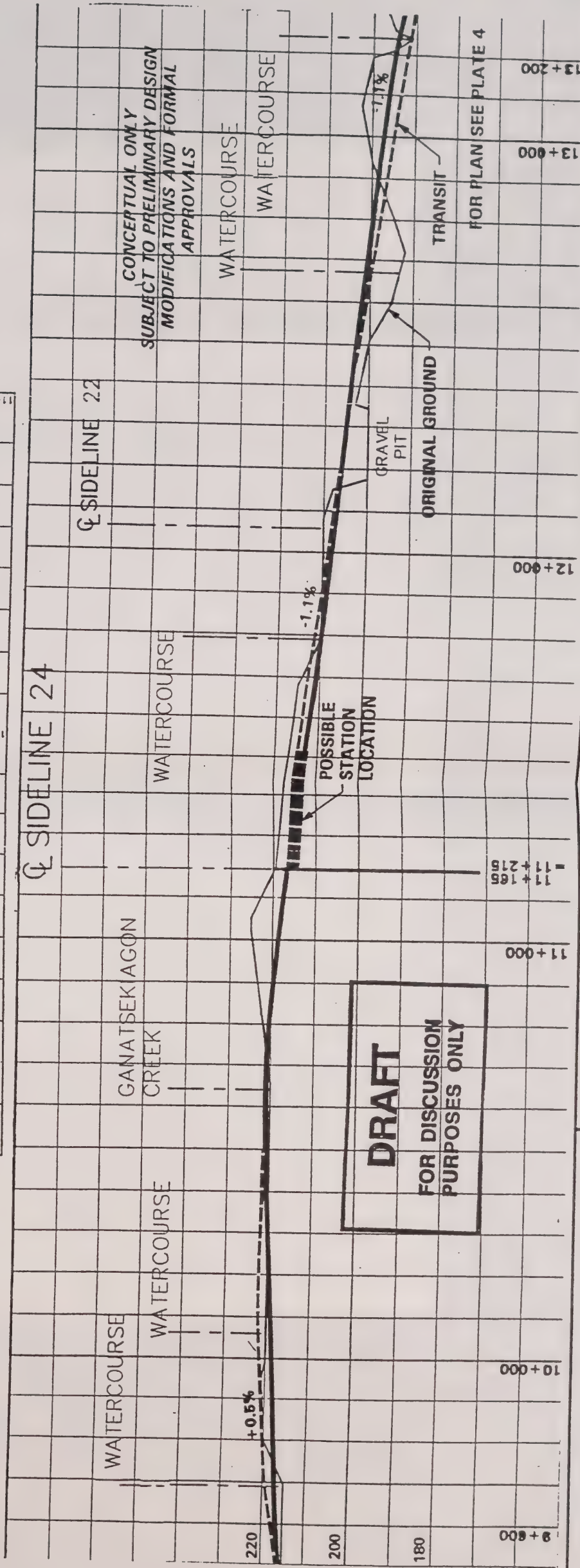
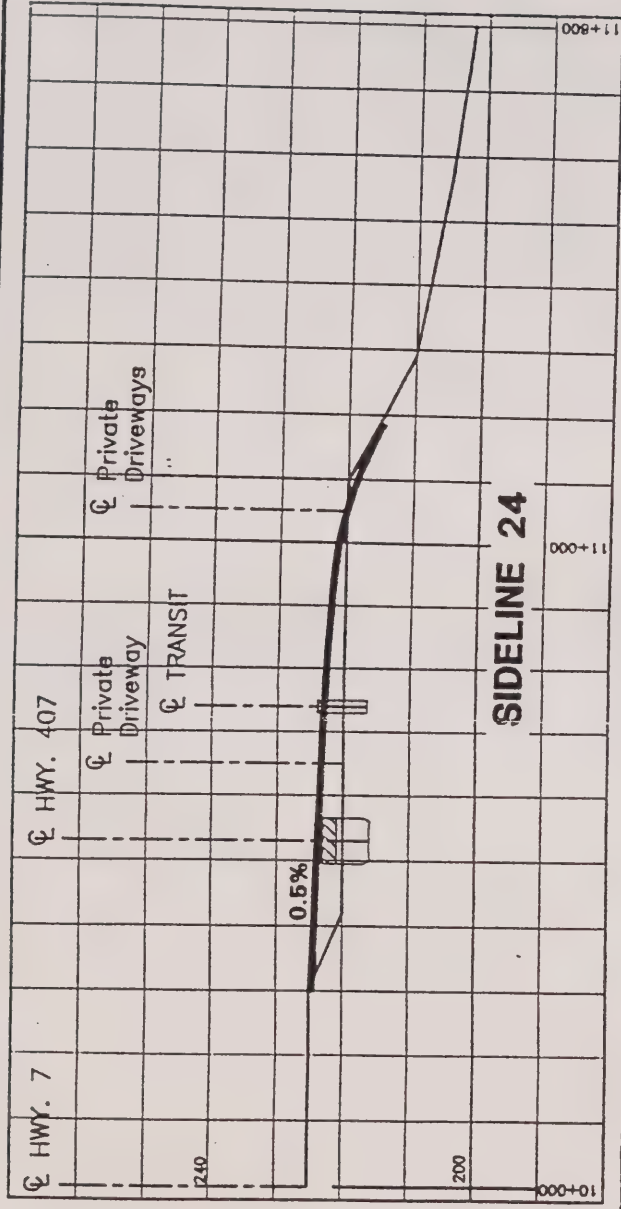


DRAFT
FOR DISCUSSION PURPOSES

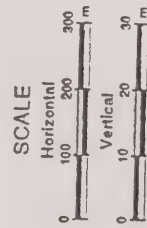


HIGHWAY 407 / TRANSITWAY
MARKHAM ROAD EASTERLY TO
HIGHWAY 7 EAST OF BROCK ROAD

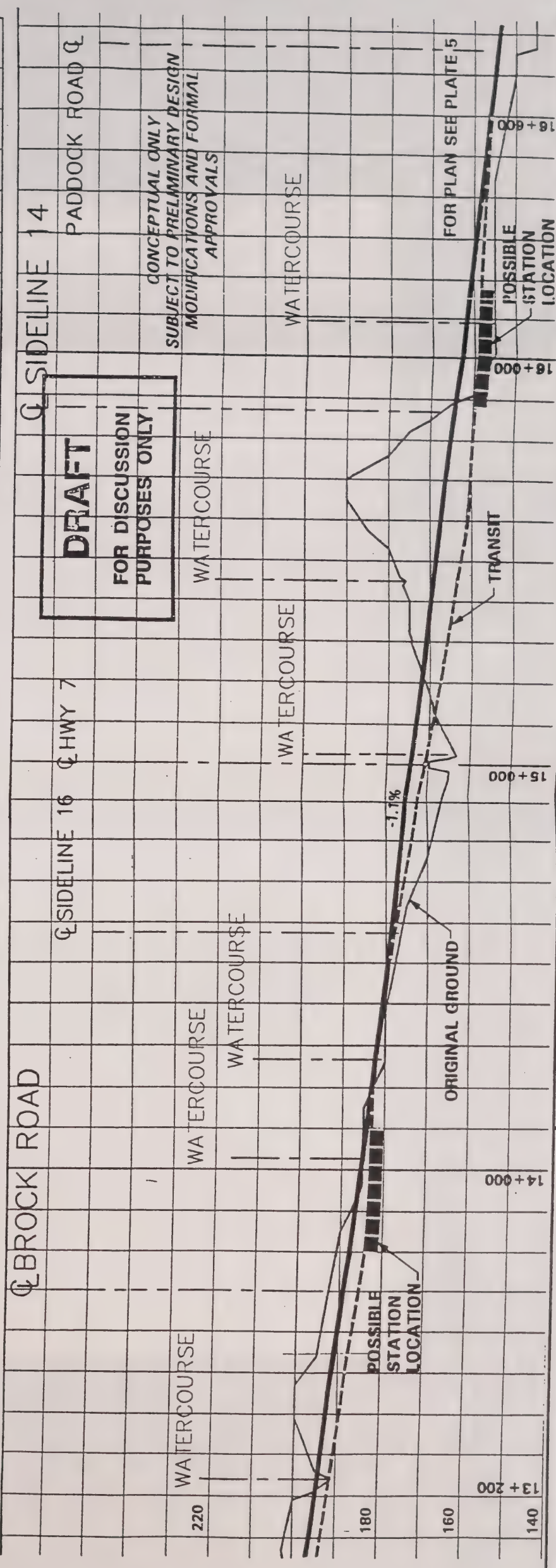
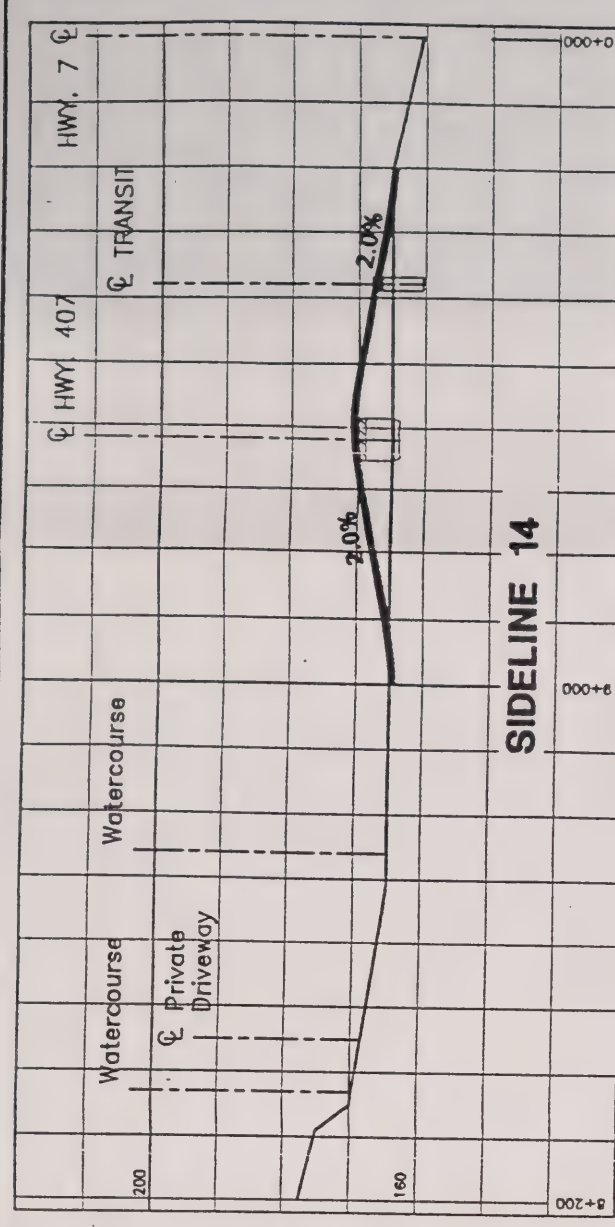
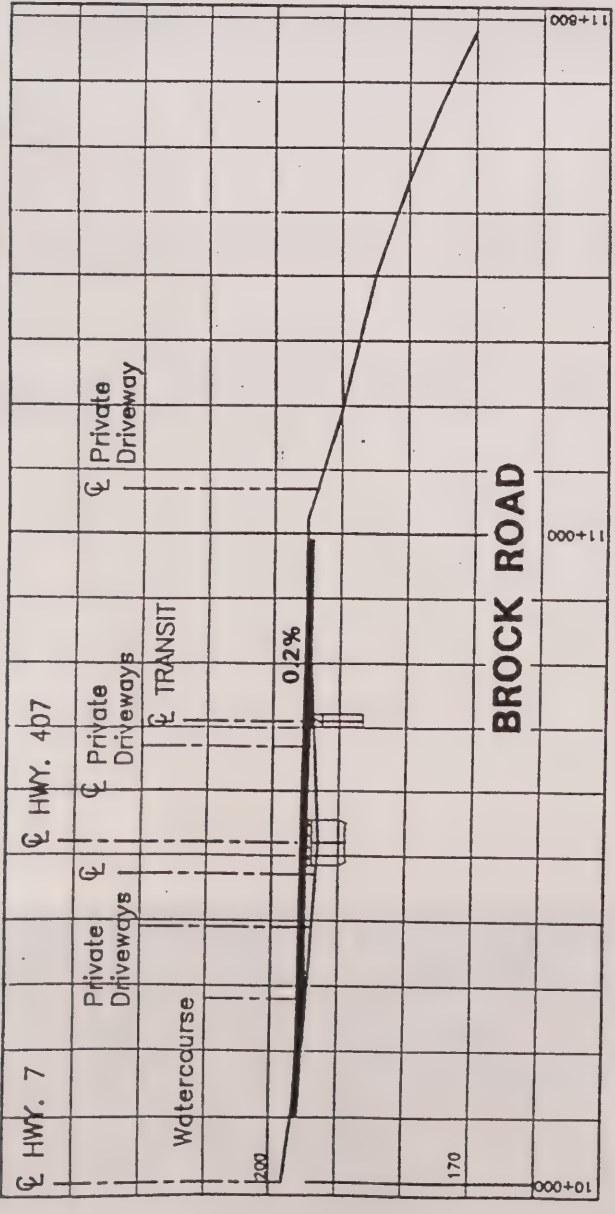
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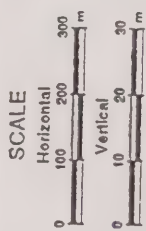
HIGHWAY 407 / TRANSITWAY
MARKHAM ROAD EASTERLY TO
HIGHWAY 7 EAST OF BROCK ROAD



TECHNICALLY PREFERRED ROUTE
CONCEPT PROFILE



HIGHWAY 407 / TRANSITWAY
MARKHAM ROAD EASTERLY TO
HIGHWAY 7 EAST OF BROCK ROAD



TECHNICALLY PREFERRED ROUTE
CONCEPT PROFILE

APPENDIX 19

FISHERIES STUDIES

APPENDIX 19.1
1995 FISHERIES AND AQUATIC HABITAT STUDY

NOTE TO THE READER

The following is an excerpt from Fisheries and Aquatic Habitat Section of the Detailed Aquatic and Terrestrial Biological Study completed by Fenco MacLaren Inc. in 1995. Although the report covers the entire technically preferred route determined through the Route Planning Study from Highway 48 (Markham Road) to the Whitby/Oshawa Boundary, only those sections that are relevant to the portion of Highway 407/Transitway between Markham Road and Highway 7 east of Brock Road, have been included here. Pages 30-56 of the original report are not provided here because they dealt with the route east of the study limits of this undertaking.

This report was reviewed by MNR and MTRC and several improvements were suggested. These improvements have been taken into account in the main body of this EA Report, and/or the MTO Fisheries Inventory (see Appendix 19.2). The comments will be considered further as part of the Stakeholder Consultation Process.

The field notes (referred to as Appendix 2 in this Appendix) have not been included here. They are available to review agencies upon request.

(West)

5.0 FISHERIES AND AQUATIC HABITAT

5.1 Introduction

This section of the report describes fisheries and aquatic habitat at the 'sub-reach' or site-specific feature level for each watercourse crossing of the proposed Highway 407 Technically Preferred Route from the western limits of the highway study corridor, Highway 48 to the Oshawa/Whitby boundary. (Figure 5.1, at the end of Section). Table 5.1.1 provides a list of these aquatic units. The eastern portion of the study corridor is described in the companion report.

All stream channels segments crossed by the study area corridor are classified initially according to a basic habitat classification system developed in consultation with Ontario Ministry of Natural Resources (OMNR) for this project (Table 2.3.1). Detailed habitat descriptions of the three study zones (crossing, upstream, and downstream) at a site-specific feature level are then provided based on field assessments using the methods developed by the OMNR (1989). Individual crossing units, which were surveyed but found to have low to negligible significance as fish habitat (e.g., some intermittent agricultural drains, swales or ephemeral streams) are listed but are not described separately at the same level of detail. Factors limiting fish habitat in these channels are described. Detailed channel descriptions are available for all crossings of the Highway 407 Technically Preferred Route in the detailed data records (Volume 2 of this report).

Field visits were conducted in the spring, late summer and fall of 1994. Detailed habitat assessment were conducting for all crossings at base flow conditions (August). Spring (April-May) and fall (October) visits were undertaken to determine the presence of spawning fish (e.g., migratory salmonids, brook trout).

5.2 Description and Assessment

5.2.1 Rouge River Watershed

The Technical Preferred Route crosses eight watercourses in the Rouge River watershed (Maps 000 and 034). Of these, the Rouge River (AL1900) and Little Rouge Creek (AL1700) are significant. Both watercourses are designated by the OMNR as migratory streams for Lake Ontario salmonids. The Rouge River is considered a warmwater system, while OMNR has identified Little Rouge Creek as a potential coldwater system with habitat conditions for resident

TABLE 5.1.1
LIST OF AQUATIC UNITS - WEST

UNIT	UNIT TYPE	WATERSHED	WATERSHED CODE	GIS MAP REF	REGIONAL MUNICIPALITY	MUNICIPALITY	LOT	CON-CESSION
AL1900	Warmwater Migratory Stream	Rouge River	2HC-9	000	York Region	Town of Markham	8	8
AL1794	Intermittent Warmwater	Rouge River	2HC-9	000	York Region	Town of Markham	8	8
AL1780	Intermittent Warmwater	Rouge River	2HC-9	000	York Region	Town of Markham	9	9
AL1761	Intermittent Warmwater	Rouge River	2HC-9	034	York Region	Town of Markham	9	9
AL1780	Intermittent Warmwater	Rouge River	2HC-9	034	York Region	Town of Markham	9	9
AL1720	Intermittent Warmwater	Rouge River	2HC-9	034	York Region	Town of Markham	9	9
AL1719	Agricultural Swale	Rouge River	2HC-9	034	York Region	Town of Markham	9	10
AL1700	Potential Coldwater/Migratory	Rouge River	2HC-9	034	York Region	Town of Markham	9	10
AL1673	Agricultural Swale	Petticoat Creek	2HC-9	034	York Region	Town of Markham	9	10
AL1672	Agricultural Swale	Petticoat Creek	2HC-9	034	York Region	Town of Markham	9	10
AL1671	Agricultural Swale	Petticoat Creek	2HC-9	034	York Region	Town of Markham	9	10
AL1670	Intermittent Warmwater	Petticoat Creek	2HC-9	034	York Region	Town of Markham	10	10
AA1855	Pond	Petticoat Creek	2HC-9	034	Durham Region	Town of Pickering	35	5
AL1852	Agricultural Swale	Petticoat Creek	2HC-9	071	Durham Region	Town of Pickering	35	5
AL1830	Coldwater Stream	Duffins Creek	2HC-10	071	Durham Region	Town of Pickering	33	5
AL1811	Intermittent Coldwater	Duffins Creek	2HC-10	071	Durham Region	Town of Pickering	32	5
AL1810	Intermittent Coldwater	Duffins Creek	2HC-10	071	Durham Region	Town of Pickering	31	5
AL1580	Intermittent Coldwater	Duffins Creek	2HC-10	071	Durham Region	Town of Pickering	28	5
AL1570	Intermittent Coldwater	Duffins Creek	2HC-10	071	Durham Region	Town of Pickering	27	5
AL1560	Intermittent Coldwater	Duffins Creek	2HC-10	107	Durham Region	Town of Pickering	26	5
AL1510	Intermittent Coldwater	Duffins Creek	2HC-10	107	Durham Region	Town of Pickering	23	5
AL1470	Intermittent Coldwater	Duffins Creek	2HC-10	107	Durham Region	Town of Pickering	21	5
AL1480	Intermittent Coldwater	Duffins Creek	2HC-10	107	Durham Region	Town of Pickering	20	5
AL1420	Intermittent Coldwater	Duffins Creek	2HC-10	147	Durham Region	Town of Pickering	18	5
AL1400	Intermittent Coldwater	Duffins Creek	2HC-10	147	Durham Region	Town of Pickering	17	5
AL1380	Coldwater Stream	Duffins Creek	2HC-10	147	Durham Region	Town of Pickering	16	6
AL1340	Intermittent Stream	Duffins Creek	2HC-10	147	Durham Region	Town of Pickering	15	6
AL1310	Coldwater Stream	Duffins Creek	2HC-10	147	Durham Region	Town of Pickering	14	6
AL1291	Unclassified Intermittent	Duffins Creek	2HC-10	147	Durham Region	Town of Pickering	13	6
AL1280	Warmwater Migratory Stream	Duffins Creek	2HC-10	147	Durham Region	Town of Pickering	12	6
AL1280	Intermittent Coldwater	Duffins Creek	2HC-10	177	Durham Region	Town of Pickering	11	6
AA1230	Pond	Carruthers Creek	2HC-12	177	Durham Region	Town of Pickering	8	6
AL1210	Intermittent Warmwater	Carruthers Creek	2HC-12	177	Durham Region	Town of Pickering	8	6
AL1191	Intermittent Warmwater	Carruthers Creek	2HC-12	177	Durham Region	Town of Pickering	8	6
AL1190	Intermittent Warmwater	Carruthers Creek	2HC-12	177	Durham Region	Town of Pickering	8	6
AL1170	Intermittent Warmwater	Carruthers Creek	2HC-12	177	Durham Region	Town of Pickering	6	6
AL1160	Intermittent Warmwater	Carruthers Creek	2HC-12	177	Durham Region	Town of Pickering	5	6
AL1140	Intermittent Warmwater	Carruthers Creek	2HC-12	177	Durham Region	Town of Pickering	4	6
AL1110	Intermittent Warmwater	Lynde Creek	2HC-11	210	Durham Region	Town of Pickering	3	6
AL1083	Agricultural Swale	Lynde Creek	2HC-11	210	Durham Region	Town of Pickering	1	6
AL1082	Agricultural Swale	Lynde Creek	2HC-11	210	Durham Region	Town of Pickering	1	6
AL1060	Intermittent Warmwater	Lynde Creek	2HC-11	210	Durham Region	Town of Whitby	34	6
AL1030	Agricultural Swale	Lynde Creek	2HC-11	210	Durham Region	Town of Whitby	33	6
AL1011	Unclassified Intermittent	Lynde Creek	2HC-11	210	Durham Region	Town of Whitby	32	6
AL1010	Coldwater Stream	Lynde Creek	2HC-11	210	Durham Region	Town of Whitby	31	6
AL980	Coldwater Stream	Lynde Creek	2HC-11	242	Durham Region	Town of Whitby	30	6
AL960	Intermittent Coldwater	Lynde Creek	2HC-11	242	Durham Region	Town of Whitby	28	6
AL932	Agricultural Swale	Lynde Creek	2HC-11	242	Durham Region	Town of Whitby	26	5
AL931	Agricultural Swale	Lynde Creek	2HC-11	242	Durham Region	Town of Whitby	25	5
AL920	Coldwater Migratory Stream	Lynde Creek	2HC-11	277	Durham Region	Town of Whitby	23	5
AL890	Intermittent Warmwater	Lynde Creek	2HC-11	277	Durham Region	Town of Whitby	22	5
AL870	Intermittent Warmwater	Pringle Creek	2HC-11	277	Durham Region	Town of Whitby	21	5
AL860	Agricultural Swale	Pringle Creek	2HC-11	277	Durham Region	Town of Whitby	20	5
AL851	Agricultural Swale	Pringle Creek	2HC-11	277	Durham Region	Town of Whitby	19	5
AL820	Coldwater Migratory Stream	Oshawa Creek	2HD-3	277	Durham Region	City of Oshawa	17	5

coldwater species. As noted, in Section 4.2, the redbreasted dace has been collected upstream of the study corridor.

Six other watercourses within this watershed are crossed by the Highway 407 Technically Preferred Route. Each of these are considered intermittent warmwater streams and were observed dry during field investigations in 1994. These six unnamed tributaries of the Rouge River watershed are similar in characteristic in which they traverse mainly agricultural lands and provide low to no potential for fish habitat. Only tributary AL1780 was observed with traces of pooled water within the stream channel during field surveys.

A listing of the streams crossed within the watershed and their observed flow conditions at the time of the August 1994 field surveys are summarized in Table 5.2.1.

TABLE 5.2.1
ROUGE RIVER WATERSHED STREAM CROSSINGS

Name	Unit #	Stream Type	Status
Rouge River	AL1900	warmwater migratory	flow
Little Rouge Creek	AL1700	potential coldwater migratory	flow
Unnamed tributary	AL1794	warmwater intermittent	dry
Unnamed tributary	AL1780	warmwater intermittent	dry
Unnamed tributary	AL1760	warmwater intermittent	dry
Unnamed tributary	AL1761	warmwater intermittent	dry
Unnamed tributary	AL1720	warmwater intermittent	dry
Unnamed tributary	AL1719	warmwater intermittent	dry
Total # of watercourses:		8	
Total # of significant watercourses:		-2 - AL1900, AL1700	

Rouge River (AL1900)

The Rouge River in the vicinity of the proposed highway crossing is located within a deep, wooded valley, meandering through dense floodplain vegetation. Table 5.2.1.1 and Figure 5.2.1.1 summarize the main fish habitat characteristics observed within the three study zones (Highway R.O.W., upstream study area, and downstream study area).

The proposed crossing location is characterized by slow flowing water with soft sediments overlying rubble substrates. The stream course, generally is relatively deep (1.0 m) and averages 20 m in width. The west bank is densely vegetated to the waters edge with mature forest vegetation that, in some locations, provides good stream edge cover. The east bank, downstream of the proposed Highway 407 centreline, is vegetated with herbaceous floodplain species which overhang the soft shoreline sediments. Upstream of the proposed Highway 407 centreline, on the east bank, dense shrub and tree cover provide heavy shading (90%) of the stream edge and the banks average 1 m in height. Many small fish were observed in this section of the stream where deep water, instream cover and bank structure provide good habitat.

The upstream area of Rouge River crossing is characterized by a run/riffle/pool configuration. Hard substrates which are dominated by boulders (45%) provide good instream cover within this faster flowing section. Several deep pools (up to 1.5 m) provide good habitat diversity within this reach. A relatively high stream gradient exist through this section as the streambed location changes approximately 0.5 to 1 m. Stream bank cover along both banks is provided by mature forest vegetation and the bank heights reach 1 m. Grassy vegetation is prominent at the water's edge.

Approximately 100 m upstream from the proposed crossing R.O.W., a concrete dam creates an instream barrier to fish within this reach. In May, 1994, the water level of the pool upstream of the dam was elevated approximately 30 cm compared with the downstream pool. Several salmonids were noted both in the upstream and downstream pools.

Downstream of the proposed crossing R.O.W., the stream bisects a portion of the IBM Golf Course. The stream in this reach is predominately a run with upstream and downstream riffle areas. Dominant substrates are primarily rubble and boulders with sand and silts forming shoreline edges. Bank vegetation is extremely limited as managed grasses from the golf course are grown to the stream edge. This section of river has extensive algae cover with limited instream structure and habitat diversity.

Approximately 150 m downstream of the proposed crossing R.O.W., a second concrete dam within the downstream section of the study area creates an instream barrier for the migration of fish in the lower section. The dam creates an elevation change of approximately 0.75 m. A shallow pool is located on the downstream side of the dam providing staging/resting habitat for migratory salmonids.

The crossing location of the Rouge River within this section, is reported as an area of moderately high potential for groundwater upwelling (MacLaren Plansearch, 1992). Although no instream upwelling areas were observed during the field surveys, groundwater seeps were observed along the base of the steep, western stream bank, both at the crossing and upstream. The reported high water table was evident as noted, and pooled water areas and wetland vegetation were observed along the base of this steep sloped bank.

Habitat diversity, good flows, and field observations of many fish within this section of stream suggest good fish habitat in the crossing vicinity. The habitat is suitable to support larger warmwater species (e.g., smallmouth bass) and is used as migration route by Lake Ontario salmonids. It is assigned a high level of significance. Although no special sensitivities beyond those associated with habitat requirements for migratory salmonids are noted for this area, removal or redesign of barriers in this area would likely facilitate upstream fish migration.

TABLE 5.2.1.1
SUMMARY OF EXISTING CHARACTERISTICS
ROUGE RIVER (AL1900)

	Upstream	Crossing	Downstream
Stream Length	175 m	160 m	100 m
Mean Stream Width	15 m	20 m	15 m
Mean Stream Depth	30 cm	100 cm	30 cm
Bank Stability	90% stable	85% stable	100% stable
Riparian Cover	dense shore and stream edge cover but main stream channel 85% open	dense shore and stream edge cover but main stream channel 90% open	limited cover from shore grasses 100% open
Dominant Substrates	45% boulder, 35% rubble, 10% gravel, 10% sand/silt	35% rubble, 20% sand, 15% each boulder, gravel and silt each	50% rubble, 25% boulder, 15% gravel, 10% sand
Dominant Stream Configuration	run 50% riffle 25% pool 25%	flat 45% riffle 40% pool 15%	run 90% riffle 10%

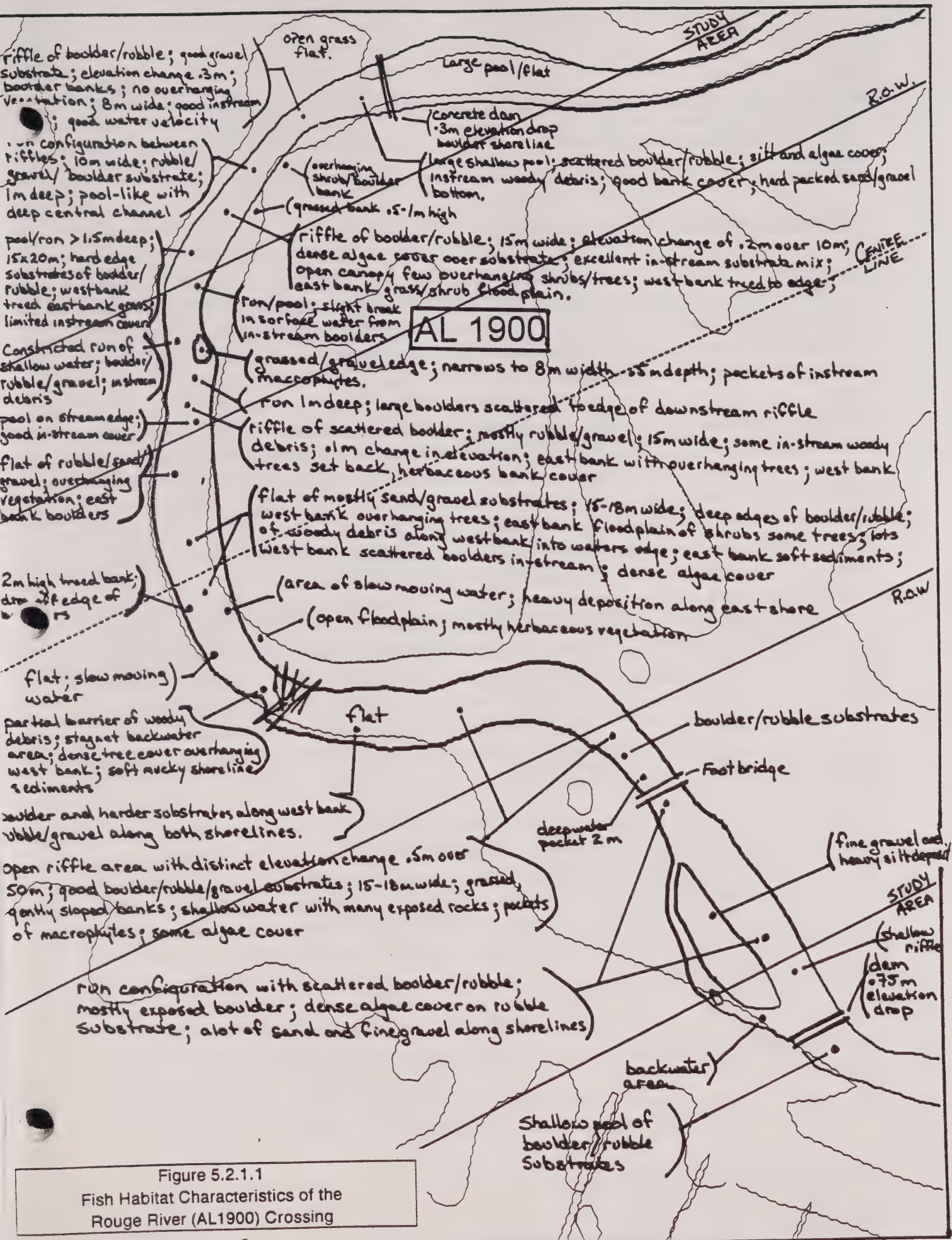


Figure 5.2.1.1

Fish Habitat Characteristics of the
Rouge River (AL1900) Crossing

Little Rouge Creek (AL1700)

The Highway 407 study area corridor crosses the Little Rouge Creek downstream of the CPR rail line. The creek is part of a naturally vegetated corridor consisting of a deep valley between agricultural table lands both to the east and west. The stream course through this area is characterized by slow flowing water and soft silt covered sediments. Table 5.2.1.2 and Figure 5.2.1.2 summarize and describe the fish habitat characteristics.

The proposed Highway 407 R.O.W. crosses the stream in an area characterized by a run/flat stream configuration. The stream channel is wide (10-15 m), relatively shallow water. Stream channel cover is limited to the east bank where overhanging trees of the dense cedar forest reach the edge of the stream bank. The low, gently sloping banks of the west side are mostly open, vegetated primarily by herbaceous floodplain vegetation. The most diverse portion of the stream is located in the vicinity of the proposed centreline of the highway crossing. Rubble/boulder riffles, good overhanging cedar vegetation, deep undercut banks and a deep water edge (west shore) provide good instream cover and habitat. Upstream from this point, within a run configuration, substrates consist of boulder and rubble. The stream channel in this location is 8-10 m wide with water depths reaching 20-30 cm. Heavy silt and algae cover is prominent in the streambed. Downstream of the proposed highway centreline the stream is wide (20 m) and shallow (0.5 - 0.75 m) with heavy silt/sand sediments over rubble substrates. Pool-like characteristics exist along shoreline edges and overhanging bank vegetation provides good stream cover. Many fish were observed inhabiting these pools and crayfish were abundant in the shallow, rubble areas of this section of stream.

Upstream of the proposed Highway 407 R.O.W., the stream channel is wide and shallow. This slow flowing area consists primarily of hard rubble/gravel substrates with instream bars of sand and silt. Instream cover from linear beds of macrophytes provide good structure for fish, which was evident from the many cyprinids and suckers noted during field surveys. Bank cover in this portion of stream is consistent with the downstream R.O.W. Dense cedar cover exists along the east bank, providing overhanging cover, and grassy floodplain vegetation occurs along the soft sediments of the west bank.

Downstream of the proposed Highway 407 R.O.W. the stream channel narrows considerably to an average width of 8 m, and in places the channel constricts to less than 3 m in width. A run/riffle complex is dominant in this area with rubble substrates characterizing the channel bed. Bank vegetation, primarily mature forest species, provides greater canopy cover than in upstream areas. The extreme downstream portion of the east bank opens into grassy gently sloping banks

within the study area. Some areas of groundwater seeps occur along the steep western bank. Algae growth and sediment dominate substrates in the slower flowing areas of the stream.

This segment of the Little Rouge River is considered highly significant due to its potential as adult fish habitat, capable of supporting a diverse fish assemblage of warm water species. Based on habitat characteristics, smallmouth bass (and other centrachids) which occur in this system are likely to be major resident sport fish in this reach. The area is also important as a migration route for Lake Ontario salmonids spawning upstream. Localized sections may be used as spawning habitat by centrachids. The stream has been given classed by OMNR as a potential coldwater stream based on temperature profiles which might be able to support resident coldwater species.

TABLE 5.2.1.2
SUMMARY OF EXISTING CHARACTERISTICS
LITTLE ROUGE CREEK (AL1700)

	Upstream	Crossing	Downstream
Stream Length	50 m	160 m	100 m
Mean Stream Width	15 m	10 m	8 m
Mean Stream Depth	50 cm	30 cm	20 cm
Bank Stability	100% stable	100% stable	100% stable
Riparian Cover	dense to partly open stream edge; main stream channel 95% open	dense to partly open stream edge/floodplain; main channel 90% open	dense stream edge cover; main channel 90% open
Dominant Substrates	35% rubble, 30% gravel, 20% silt, 10% boulder	70% rubble, 10% each boulder, gravel, and silt,	50% rubble, 20% gravel, 10% each boulder sand and silt
Dominant Stream Configuration	100% flat	40% run, and 30% each riffle and flat	30% flat, 25% each riffle and run, 20% pool

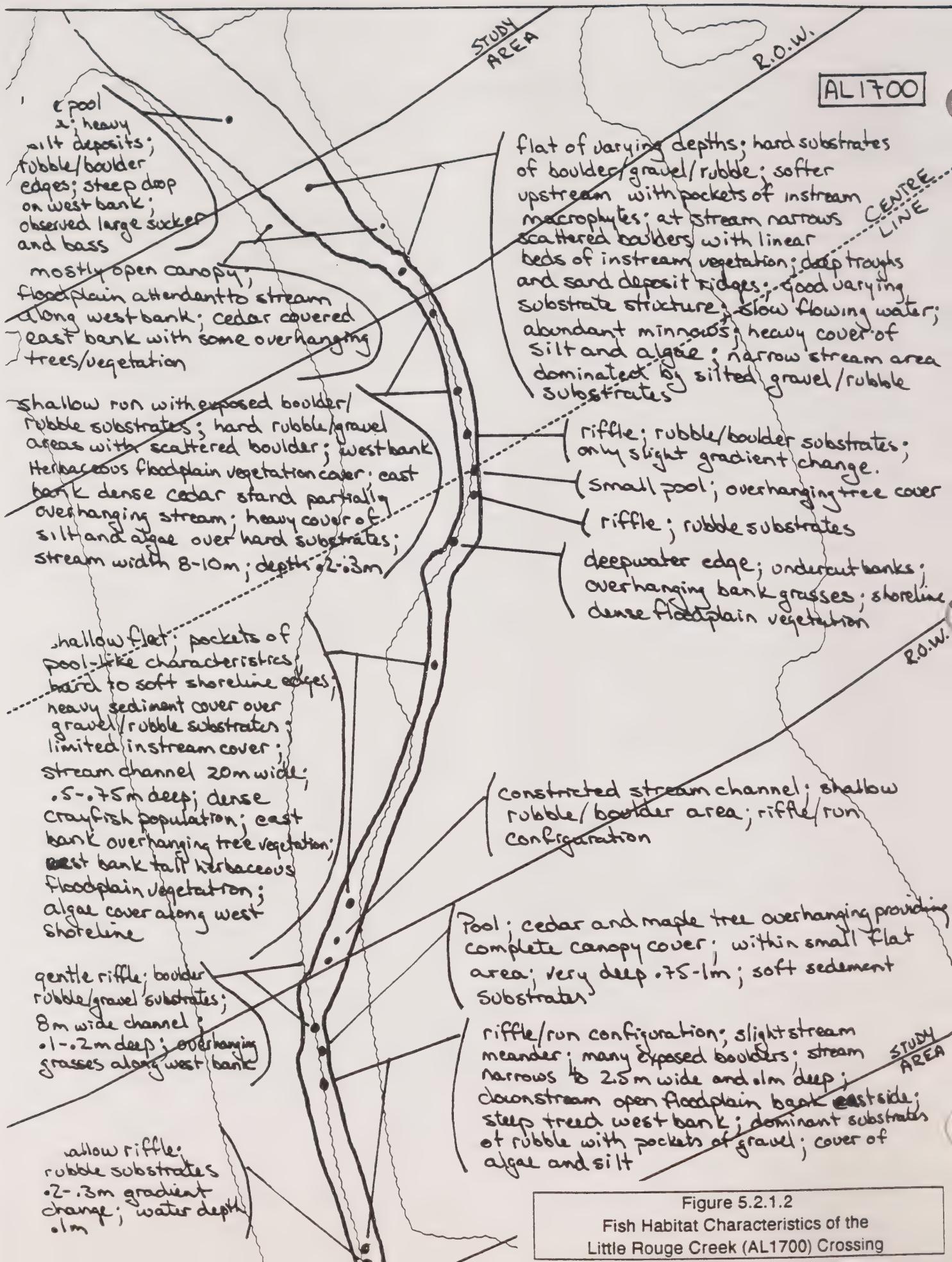


Figure 5.2.1.2
Fish Habitat Characteristics of the
Little Rouge Creek (AL1700) Crossing

5.2.2 Petticoat Creek Watershed

Low potential exists for any fisheries and aquatic habitat to be crossed by the 407 Technically Preferred Route within this watershed. A total of five watercourses are crossed by the proposed highway (Maps 034 and 071), four of which are agricultural swales and the other (Petticoat Creek AL1670) is classified as an intermittent warmwater stream. In addition, the Technically Preferred Route encroaches upon a man-made pond (0.8 ha).

Petticoat Creek traverses active agricultural lands within the Highway 407 study area. The stream, in places, is well defined with little to no bank cover while other sections are cultivated over, in the vicinity of the proposed highway centreline, for crop planting. The substrates in the stream channel are covered with loamy soils (i.e., most likely from agricultural sources) in the upstream portions with some growth of instream grasses. Downstream the channel disperses into a wet old-field/shrubland where the channel definition is unclear.

The other four streams are cultivated over by active agricultural practices and provide only seasonal field drainage in the vicinity of the proposed highway crossing. No potential fish habitat exists within any of these drainages. Table 5.2.2 lists the watercourses crossed within the watershed and identifies stream flow conditions at the time of the August field surveys.

With the exception of AL1670 which has a seasonally moderate level of significance, all of the watercourses described above have very low to no significance based on the evaluation criteria.

TABLE 5.2.2
PETTICOAT CREEK WATERSHED STREAM CROSSINGS

Name	Unit #	Stream Type	Status
Petticoat Creek	AL1670	intermittent warmwater	dry
Unnamed tributary	AL1673	agricultural swale	dry
Unnamed tributary	AL1672	agricultural swale	dry
Unnamed tributary	AL1671	agricultural swale	dry
Unnamed tributary	AL1652	agricultural swale	dry
Total # of watercourses		5	
Total # of swales:		4	
Total # of intermittent warmwater		1	

5.2.3 Duffins Creek Watershed

Streams crossed by the study area corridor in this watershed include intermittent and permanent coldwater systems associated with West Duffins and Duffins Creeks (Maps 071, 107, 147 and 177). A total of 17 watercourses are crossed within the watershed of which four are permanent and ten are intermittent coldwater systems. Table 5.2.3 provides a listing of all streams crossed within the watershed, their designation and stream flow conditions at the time of the summer field surveys.

West Duffins Creek (AL1630) and Duffins Creek (AL1280) are considered to be the most significant fisheries resources within the watershed. Both streams are permanent coldwater systems with the latter (Duffins Creek) providing a migratory run for Lake Ontario salmonids. An instream barrier, the Whitevale Dam, located just downstream of the Highway 407 study area corridor, prohibits the movement of lake run salmonids into the study area within West Duffins Creek. Other streams crossed within the proposed highway study area that provide have potential fish habitat include Urfé Creek (AL1460), Brougham Creek (AL1420), Spring Creek (AL1400) and two unnamed tributaries to Duffins Creek (AL1380 and AL1310).

Redside dace ("vulnerable") and stonecat ("regionally rare") are known to occur in this drainage basin.

TABLE 5.2.3
DUFFINS CREEK WATERSHED STREAM CROSSINGS

Name	Unit #	Stream Type	Status
West Duffins Creek	AL1630	coldwater	flow
Unnamed trib. to West Duffins Creek	AL1631	intermittent coldwater	dry
Unnamed trib. to West Duffins Creek	AL1610/1611	intermittent coldwater	dry
Unnamed tributary	AL1580	agricultural swale	dry
Unnamed tributary	AL1570	agricultural swale	dry
Ganetsekiagon Creek	AL1560	intermittent coldwater	dry
Unnamed tributary	AL1510	intermittent coldwater	dry
Unnamed tributary	AL1470	intermittent coldwater	dry
Urfé Creek	AL1460	intermittent coldwater	no flow
Brougham Creek	AL1420	intermittent coldwater	flow
Spring Creek	AL1400	intermittent coldwater	dry
Unnamed tributary	AL1380	coldwater	flow
Unnamed tributary	AL1340	agricultural swale	dry
Unnamed tributary	AL1310	coldwater	flow
Unnamed tributary	AL1291	intermittent coldwater	dry

TABLE 5.2.3
DUFFINS CREEK WATERSHED STREAM CROSSINGS
 (continued)

Name	Unit #	Stream Type	Status
Duffins Creek	AL1280	coldwater migratory	flow
Unnamed tributary	AL1260	intermittent coldwater	dry
Total # of watercourses:		17	
Total # of coldwater		4	
Total # of intermittent coldwater		10	
Total # of migratory streams		1	
Total # of other		3	

West Duffins Creek (AL1630)

West Duffins Creek supports both warmwater and coldwater fish species in the vicinity of the proposed Highway 407 crossing. A barrier, located downstream of the study area, prohibits the movement of lake run salmonids.

Within the study area, this stream meanders (sinuosity 1.06-1.5 range) through a relatively open floodplain with most of the attendant forest cover set back from low, mostly stable banks. Table 5.2.3.1 and Figure 5.2.3.1 describe and summarize fish habitat characteristics within the three study area zones.

Upstream of the crossing R.O.W., the stream course is characterized by a slow flowing area dominated by sand and gravel substrates. Stream width in this area reaches 10-12 m and depths average 0.3 m. A heavy silt deposit covers most substrates. The channel is predominantly open but some cover is provided on the west bank by a dense cedar stand near the stream edge. The east banks are approximately 1 m in height and are primarily vegetated with tall, floodplain grasses. Within the downstream portion of this area, the remnants of a boulder dam create a stream barrier of a 0.7 m elevation drop. The boulder dam consists of two parts, one on each side of a central instream grassed barr.

The R.O.W. corridor of the proposed highway crosses West Duffins Creek in an open portion of the stream where floodplain characteristics dominate both east and west stream banks. Stream configurations are characterized by run and riffle with gravel providing over 50% of the substrate type within this reach.

Several pools along the west bank, where stream depths are generally greatest, provide good cover and diverse habitat when associated with undercut banks, overhanging bank grasses and bank roots.

Downstream watercourse characteristics are generally the same as those found within the R.O.W. with the exception that attendant forest vegetation which provides a more closed canopy over the main stream channel. Substrates are primarily rubble in a run/riffle stream configuration. Some undercut banks and overhanging stream bank vegetation provide good cover, as do pockets of instream macrophytes within this portion of the study area. Substrates are generally covered by algae and a thin layer of coarse sediments.

In all zones of the study area many fish were noted, specifically within stream edge pools within the proposed Highway 407 R.O.W. Although upwelling areas were not observed within the stream channel, groundwater seeps were evident along the base of the steep sloping west bank and in wetland pockets within the floodplain attendant to the stream.

The redbside dace (*Clinostomus elongatus*) and the stonecat (*Noturus flavus*) are known to occur in the system and may occur in this reach. The redbside dace is a "vulnerable" species and the stonecat is designated as being "regionally rare". Therefore, without further site-specific fish survey data, this segment of West Duffins Creek is designated as being highly significant. Sensitivities of note include the limited recharge areas and unstable steep sloping bank areas. These limited recharge areas may be critical in maintaining stream temperature profiles critical to existing fish communities and therefore care must be taken not to interrupt or alter their flow to the system at this point. Banks susceptible to erosion, could result in turbidity and sedimentation problems which could eliminate some sensitive species.

TABLE 5.2.3.1
SUMMARY OF EXISTING CHARACTERISTICS
WEST DUFFINS CREEK (AL1630)

	Upstream	Crossing	Downstream
Stream Length	50 m	160 m	100 m
Mean Stream Width	10 m	8 m	8 m
Mean Stream Depth	30 cm	30 cm	25 cm
Bank Stability	90% stable	85% stable	75% stable
Riparian Cover	densely treed shoreline with some grassed floodplain but main channel 100% open	large area of attendant floodplain but some dense treed shoreline; main channel 85% open	dense tree shoreline cover with portions of vegetated floodplain; main channel 75% open
Dominant Substrates	35% sand, 30% gravel, 10% rubble and 5% each boulder and silt	65% gravel, 15% rubble, 10% each boulder and silt	70% rubble, and 10% each boulder and silt
Dominant Stream Configuration	90% flat, 10% riffle	45% run, 30% riffle, 15% pool, and 10% flat	60% run and 40% riffle

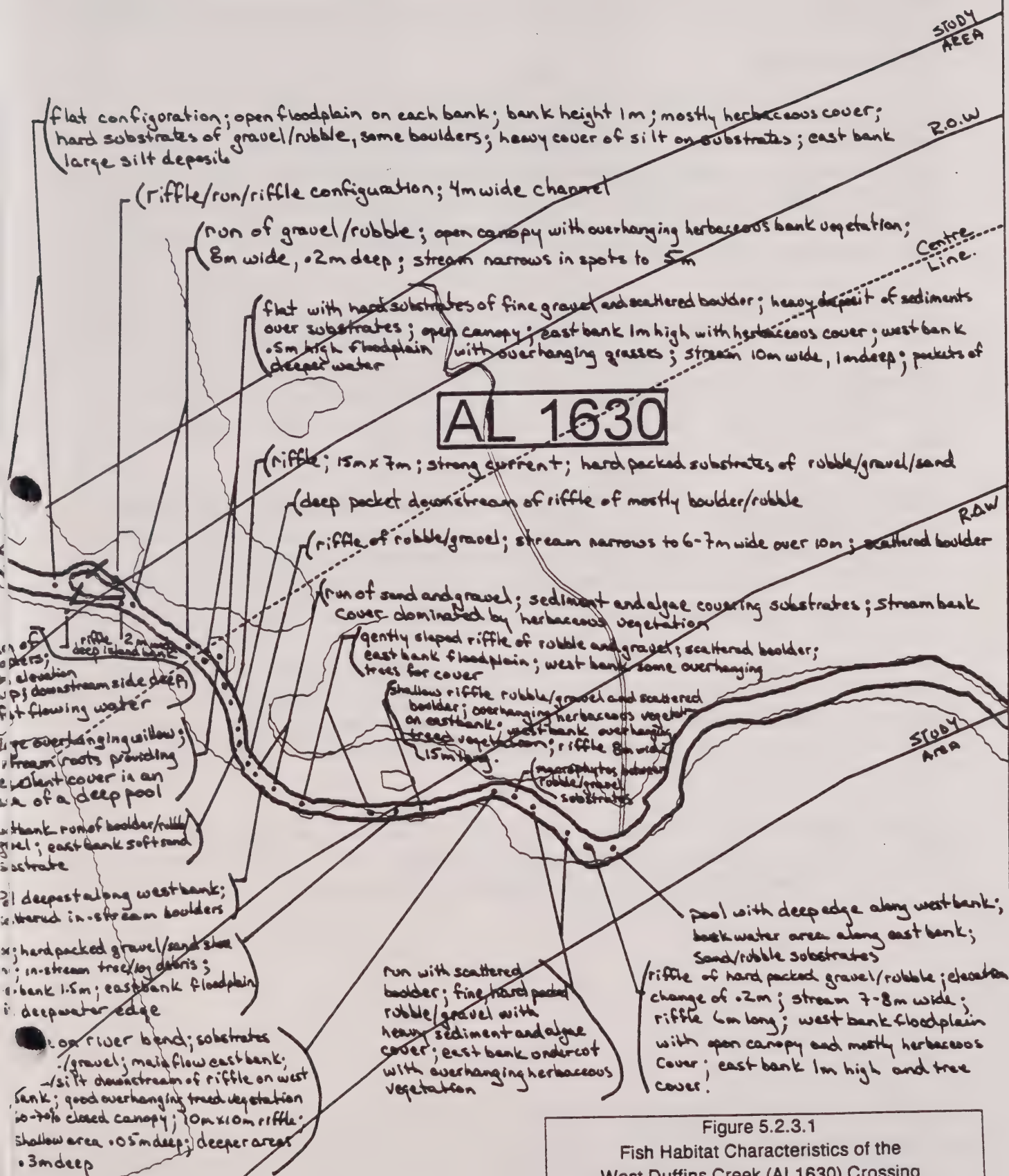


Figure 5.2.3.1
Fish Habitat Characteristics of the
West Duffins Creek (AL1630) Crossing

Urfé Creek (AL1460)

Urfé Creek, within the study area of the proposed Highway 407 Technically Preferred Route, is characterized as an intermittent coldwater system. The stream in this area traverses a deeply cut woodland valley. Although found dry during all field surveys, Urfé Creek provides seasonal habitat in the upstream reaches and more permanent coldwater habitat downstream of the Highway 407 study corridor. Table 5.2.3.2 and Figure 5.2.3.2 summarize and describe general fish habitat conditions of the creek within the Highway 407 area zones.

Within the upstream portion of the study area Urfé Creek transforms from a densely grassed channel, that bisects old-field/wetland vegetation, to a distinctly defined soil covered channel consisting of a slight meander through edge communities of a mature upland forest valley. The channel has soil substrates and is less than 0.5 m wide. Areas of extreme bank erosion were noted along the west edge of the stream and large soil deposits were observed in downstream areas.

Within the R.O.W. study area, the stream channel remains mostly dry with the some small pools of water persisting in downstream areas. Stream canopy is dense with mature tree growth and some shrub cover rooted within the channel banks. A distinct gradient change in this portion of the crossing is evident and this segment would support run/riffle/pools if flowing water were present. Rubble, gravel and sand substrates are present within this dry channel.

At the upstream edge of the downstream study area groundwater seep stains are evident along the stream channel which consist primarily of rubble gravel substrates. Pooled water is frequent between dry channel sections of boulder/rubble substrates with detritus and algae cover heavy within these wet pockets. Fish were observed frequently within these shallow pockets with many frogs inhabiting the detritus edges.

This study segment of Urfe Creek is considered to have moderate to low significance as fish habitat. Standing pools provide habitat for minnows and amphibians. Some fish species such as cyprinid minnows may use these areas for reproduction during non-flowing periods.

TABLE 5.2.3.2
SUMMARY OF EXISTING CHARACTERISTICS
URFÉ CREEK (AL1460)

	Upstream	Crossing	Downstream
Stream Length	50 m	160 m	100 m
Mean Stream Width	1 m	0.8 m	1.0 m
Mean Stream Depth	0 cm	0 cm	0 cm
Bank Stability	50% stable	85% stable	15% unstable 75% stable
Riparian Cover	good tree cover in stream vicinity but not full canopy coverage; 75% open	mature tree cover within entrenched valley, sparse dense stream cover; 95% partly open	mature tree cover within entrenched valley, sparse stream cover; 90% partly open
Dominant Substrates	60% soil and 10% each rubble, gravel, and silt	30% rubble, 20% each gravel and sand; and 5% boulder, 10% silt	30% rubble, 20% each gravel and sand; and 10% boulder
Dominant Stream Configuration	dry stream bed and partially defined stream channel	dry stream bed with moist and wet pools, mostly riffle and pool structure	dry streambed with some wet pools; mostly rifle and pool structure

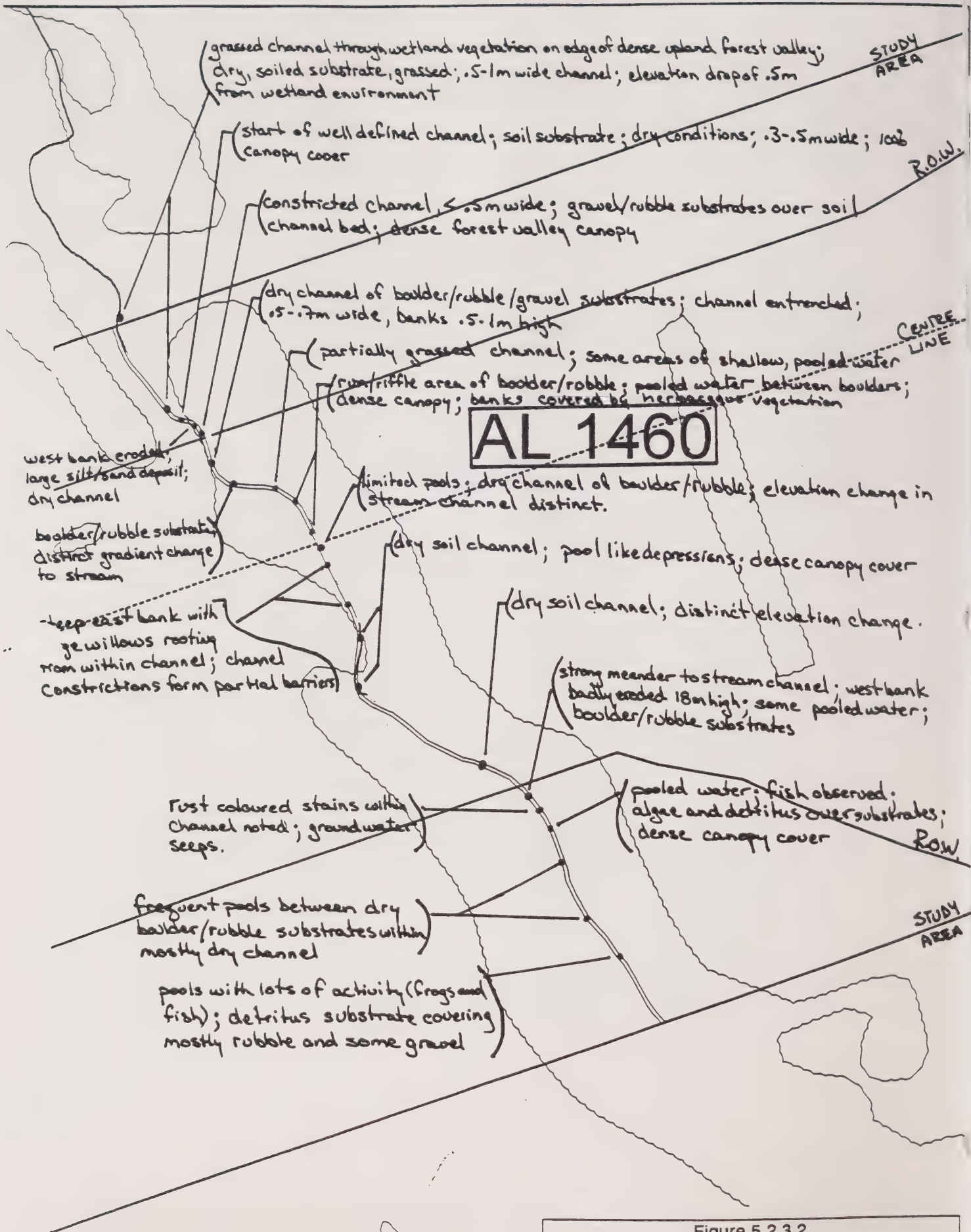


Figure 5.2.3.2
Fish Habitat Characteristics of
Urfe Creek (AL1460) Crossing

Brougham Creek (AL1420)

The potential crossing of Brougham Creek is located just south of the Town of Brougham (where the stream leaves a predominantly agricultural setting and the channel is well defined). The upstream portion of the study area includes reaches of the stream that will potentially be affected by the proposed development of an interchange at Brock Road. Table 5.2.3.3 and Figure 5.2.3.3 provide a summary and illustration of the stream characteristics for the Highway 407 study area zones.

The upstream reaches of this intermittent coldwater system, observed mostly dry during field surveys, meanders through a moderately deep wooded valley. Canopy cover is partly open with dense patches. The stream channel averages 2 m in width and flowing water reaches depths of 3 cm, in the downstream portions of this area.

Stream channel substrates are composed of mostly soil with some sand, rubble and sparse gravel areas. Areas of open, wetland flats are attendant to the stream edge and groundwater contributions from these wet areas provide flow to the stream.

The areas of flowing water in the upstream study area are predominately characterized by a flat configuration with shallow pools noted in channel depressions.

The flat channel continues into the R.O.W. of the proposed crossing with a steeper channel gradient providing several riffle and pool areas. A narrower stream channel (1 m wide), is evidence of the gradient change. Substrates, although still predominately soil, consist of higher percentages of rubble, gravel, and sand. The stream channel remains within the woody cover of the moderately deep valley and canopy cover remains partly open. Increased density of bank vegetation is found in this area with some vegetation providing instream and overhanging cover. Groundwater seeps along stream banks and staining within the channel's edge are common within this portion of the proposed crossing.

The downstream reach of the study area consists of a more prominent meander consisting of a riffle/run stream configuration. Substrates are dominated by rubble, gravel and silts with only a few areas of soil based channel that dominated the upstream and R.O.W. reaches of Brougham Creek. The stream banks provide some cover from undercut and instream rooted sections. A treed canopy persists but bank vegetation of dense shrub provides the stream with areas of dense canopy cover. Stream channel dimensions average 1.2 m and 5 cm width and depth, respectively, but deep pools and flat sections increase stream width to greater than 2 m. Stream bank heights

remain similar to those in the upstream portion, at heights of approximately 0.5 m.

This section of Broughman Creek has only seasonally moderate significance as fish habitat despite the low flow periods and poor substrate conditions.

TABLE 5.2.3.3
SUMMARY OF EXISTING CHARACTERISTICS
BROUGHMAN CREEK (AL1420)

	Upstream	Crossing	Downstream
Stream Length	350 m	160 m	100 m
Mean Stream Width	2 m	1 m	1.2 m
Mean Stream Depth	3 cm	3 cm	5 cm
Bank Stability	30% unstable; 70% stable	20% unstable; 80% stable	10% unstable; 90% stable
Riparian Cover	stream channel within wooded valley with both sparse and dense bank cover 15% dense cover; 75% partly open	stream channel within wooded valley with sparse tree cover and areas of dense stream edge 10% dense cover; 75% partly open	stream channel within wooded valley with areas of dense bank cover from shrub and tree; 70% partly open; 30% dense
Dominant Substrates	45% soil, 30% sand; 10% each rubble and silt; 5% gravel	40% soil, 15% each rubble, gravel and sand	25% rubble, 20% gravel and silt; 15% sand; 10% soil
Dominant Stream Configuration	75% of upstream channel dry; 65% flat; 25% pool; 10% riffle	50% flat; 25% each riffle and pool	40% riffle; 30% run; 20% pool; 10% flat

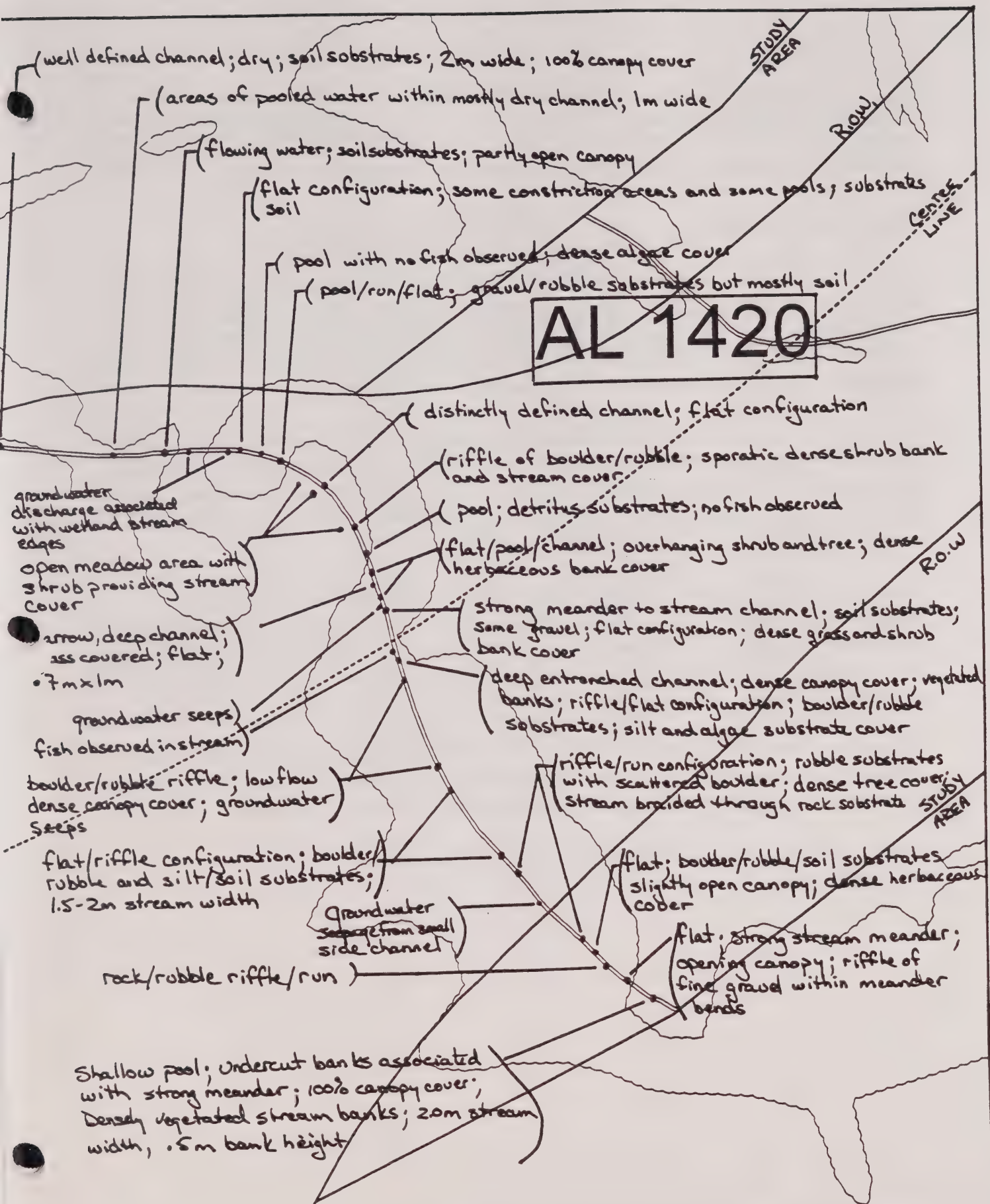


Figure 5.2.3.3
Fish Habitat Characteristics of
Brougham Creek (AL1420) Crossing

Spring Creek (AL1400)

Spring Creek is a small intermittent coldwater system with headwaters originating just north of the Town of Brougham. The stream course within the proposed Highway 407 study area is limited to a mostly dry open channel that traverses old-field/wetland areas. The stream was not observed flowing during field studies. Table 5.2.3.4 and Figure 5.2.3.4 provide a summary and illustration of watercourse conditions within the proposed highway study area.

The upstream portion of Spring Creek, located just downstream from the southeastern portion of the Town of Brougham, is characterized by a well defined, dry soil channel. The upstream portion of this area is within relatively dense tree/shrub cover providing sparse to dense canopy. Downstream the channel becomes less defined within relatively open old-field, wet meadow surroundings.

Within the proposed Highway 407 R.O.W. study area, a distinct gradient change begins and the channel becomes braided as it moves through dense herbaceous cover within a shallow, rounded valley area. No areas of pooled water within this area were noted with the exception of moist soil conditions within wetland areas located approximately in the vicinity of the proposed highway centreline.

Within the downstream study area the channel is undefined, as it braids and meanders through thick herbaceous cover. Stream course substrates are limited to soil and grasses. Stream gradient increases as the channel enters moderately dense canopy cover from mature forest species.

Limited to no fish habitat exists within this portion of Spring Creek, and is designated as having low significance.

TABLE 5.2.3.4
SUMMARY OF EXISTING CHARACTERISTICS
SPRING CREEK (AL1400)

	Upstream	Crossing	Downstream
Stream Length	50 m	160 m	100 m
Mean Stream Width	0.1 m	0.1 m	undefined
Mean Stream Depth	0 cm	0 cm	0 cm
Bank Stability	highly stable	highly stable	highly stable
Riparian Cover	80% open; 20% partly open; dense herbaceous cover in wetland environment	100% open; channel meanders through wet old-field vegetation which is dense along stream channel	65% open; 15% dense cover from woody shrubs attendant to watercourse; dense herbaceous cover
Dominant Substrates	100% soil with grassed channel bed	100% soil with grassed channel bed	100% soil and herbaceous cover
Dominant Stream Configuration	partially defined dry stream channel; 100% run	partly defined dry stream channel; 100% run	undefined channel in deep valley

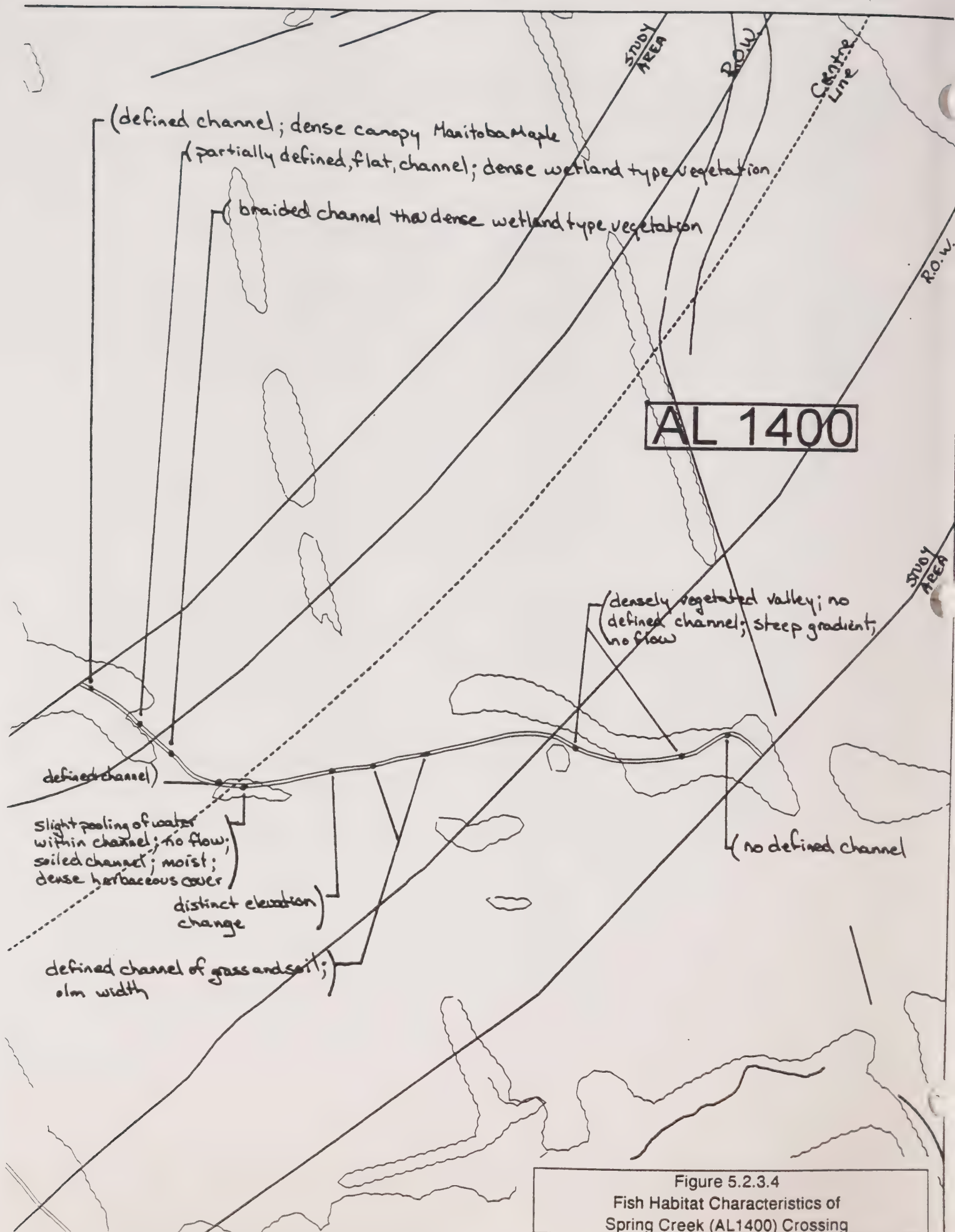


Figure 5.2.3.4
Fish Habitat Characteristics of
Spring Creek (AL1400) Crossing

Duffins Creek Tributary (AL1380)

The headwater area for this coldwater stream is located several hundred metres upstream from the potential crossing location and west of Sideline 16. The extreme upstream portion of the stream within the Highway 407 study area corridor is a dry, soil covered channel that discharges into a large irrigation pond. This pond, used by Dutchmaster Nursery, is located on the north side of Highway 7. Within the study area the stream originates as an outflow from the pond, via corrugated steel culvert, and provides a strong base flow to this coldwater system. Table 5.2.3.5 and Figure 5.2.3.5 provide a summary and illustration of fish habitat characteristics within the study area.

The upstream reach of Duffins Creek, which is very diverse in habitat structure, meanders through a dense cedar canopy of woody slash which, as well, provides excellent instream cover. Stream width averages 3 m with water depths up to 0.3 m in some pools and average depth of 5 cm. Banks are relatively unstable and composed of muck and detritus. Substrates in this area are dominated by gravel and sands with some rubble and silt characteristics. The stream has a strong meander and is characterized by a riffle, run and pool configuration. Attendant bank areas are moist with numerous pooled groundwater seeps that drain into the stream edge. Groundwater upwelling areas are present within the finer rubble/gravel substrates of this area. Several salmonids (likely brook trout) were observed within silted pools where log and rooted banks provide good cover.

Stream characteristics within the R.O.W. study area of the proposed highway crossing are similar to those described for the upstream zone. Riparian cover however, is dense only in the upstream reach where the stream remains within the cedar thicket. Downstream, between the thicket and the culvert which provides stream passage under Highway 7, bank cover is dominated by wetland grasses and thickets of willow shrub. The stream channel, averaging 2.5 m in width, is characterized by riffle, runs, flats and pools with substrates primarily of sand and gravel. Silted substrates, which are more predominant in this downstream section, provide heavy cover over hard substrates just upstream of the culvert at Highway 7.

An entrenched ditch, which arises from the elevated eastern bank of the nursery property in the location of the proposed highway centreline, serves as a significant source of siltation to the stream. Disturbed banks, and large spits and barrs of silt have formed downstream from this discharge area.

Downstream of Highway 7, yet still within the proposed crossing R.O.W., the stream course

discharges from the road culvert to a large pool. The change in elevation approximately 1 m between the culvert and pool creates a low flow barrier. The pool is large (3 to 4 m wide and 1 m deep), provides good habitat with undercut banks and instream vegetative cover. Downstream of the pool, the stream flows through the dense canopy of a cedar forest. The stream narrows, in some locations, to less than 3 m wide where a riffle/run configuration is created. Substrates are silted and consist primarily of gravel, rubble, and sands.

Within the downstream study area stream conditions slowly degrade with sand and siltier substrates becoming more dominant. Areas of heavy erosion along both banks occur frequently in this area. The stream configuration is characterized mostly by run/riffle with few pools.

Groundwater seeps, of the attendant wetland communities, are numerous in this portion of the study area. Of significance, is groundwater seepage located in the forest community northwest of this stream location. Discharge into wet woodlands forms rivulets that provide an excellent cool water source to this portion of stream. This entire portion of the study area was previously reported (MacLaren Plansearch, 1992) as a groundwater discharge zone.

Excellent fish habitat exists within the upstream portions of the study corridor but downstream stream conditions have been affected by nursery operations. High potential fish habitat remains in the lower study zones but mitigative measures and rehabilitation are required. This area is given a high significance rating due to the presence of existing high quality coldwater fish habitat that is maintained by the locally important hydrogeological conditions (good inflow of groundwater). It potentially represents an area of exceptionally high productivity for brook trout or other salmonids within the system.

TABLE 5.2.3.5
SUMMARY OF EXISTING CHARACTERISTICS
DUFFINS CREEK TRIBUTARY (AL1380)

	Upstream	Crossing	Downstream
Stream Length	50 m	160 m	100 m
Mean Stream Width	3.0 m	2.5 m	2.0 m
Mean Stream Depth	5 cm	8 cm	5 cm
Bank Stability	60% unstable; 40% stable	50% unstable; 50% stable	55% unstable
Riparian Cover	80% dense cover; 20% partly open; thick cedar cover in lowland area with attendant shrub/slash	70% partly open; 15% dense cover; within cedar thicket and open slash area adjacent to highway	100% dense cover from cedar lowland
Dominant Substrates	35% gravel; 25% sand; 15% each rubble and silt; some muck	35% sand; 30% gravel; 15% rubble; and 10% silt	35% sand; 30% gravel; 15% rubble; 10% boulder and silt
Dominant Stream Configuration	45% riffle 40% run and 10% pool	35% riffle; 25% run; 20% each flat and pools	55% run; 30% riffle; 10% flat; 5% pool

AL1380

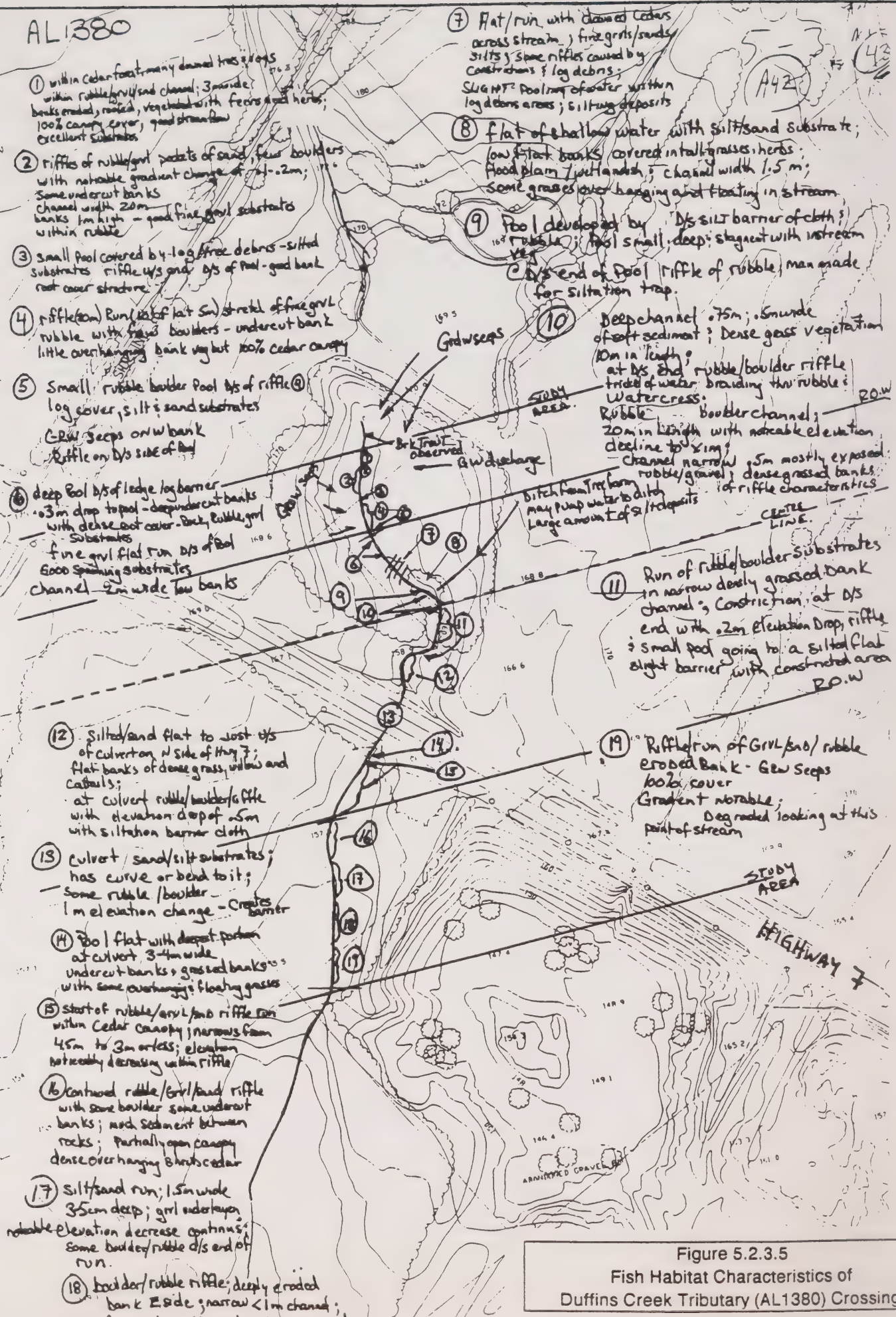


Figure 5.2.3.5
Fish Habitat Characteristics of
Duffins Creek Tributary (AL1380) Crossing

5.3 Summary of Environmentally Significant Issues

One of the very important environmental issues with respect to aquatic habitat is the Redside Dace, known to be present in streams crossed by the Proposed Highway 407. This species occurs in a very limited range throughout North America (Scott and Crossman, 1973). In Canada, the reidside dace is only known to occur in a small number of streams draining to the western end of Lake Ontario (i.e., those crossed by the proposed highway). This species requires cool, clear waters in gravel bottom streams and is usually found in association with creek chub (*Semotilus atromaculatus*). Due to increased turbidity and sedimentation of streams throughout its range, the sensitive reidside dace has become increasingly rare and, as noted previously, is listed as "vulnerable" by COSWEC. Very little is known about the biology of the species, though it is generally thought to occur in association with creek chub, where it has been studied. Although no attempt was made to collect this or any other fish species during this study, attempts have been made to identify habitats that would seem to be appropriate for use by this species given the limited knowledge of its biology in Ontario. Historical (background) data indicates that it is present in a number of the streams in the western portion of the study area but it has not been reported in streams in the eastern half of the study corridor (i.e., east of Oshawa/Whitby boundary discussed in the "East" report). In those areas where it might occur (based on habitat surveys), extra care should be taken to limit the effects of turbidity and sedimentation. Further study would be prudent to ensure the conservation of this species, given the limited information available on its specific distribution within the study area, and the extent of its range to potentially be affected by the highway development.

Table 5.3 provides a summary list of all watercourses crossed by the Highway 407 Technically Preferred Route from Highway 48 to the Oshawa/Whitby boundary, indicating the significance of fish habitat at those crossing sites and highlighting special features or sensitivities. The most significant aquatic and fish habitat is provided by the permanent cold and warmwater streams within the study area. Streams having high significance as fish and aquatic habitat within the study area include the Rouge River (AL1900), the Little Rouge River (AL1700), West Duffins Creek (AL1630), Duffins Creek (AL1280) and one of its tributaries (AL1380), West Lynde Creek (AL1010), Lynde Creek (AL920) and Oshawa Creek (AL820). Many of these streams are the migration channels for Lake Ontario salmonids moving to the important headwater reaches of the Oak Ridges Moraine. The hydrogeology of the moraine provides a very important source of groundwater in gravel bottom streams that originate there. This combination of groundwater upwelling in gravel substrates creates ideal spawning habitat for salmonids. There are locations within the R.O.W., notably in Duffins Creek, where fish spawning does occur. Protection of spawning areas and migration routes to these spawning areas is critical to the reproductive

success and productivity of both resident stream dwelling and lake Ontario salmonids.

The majority of watercourses investigated within the R.O.W. study area were found to be intermittent channels and agricultural swales. In general, these were considered to represent very limited fish habitat due to their ephemeral nature and the often poor condition of substrates. Often such channels were isolated or destroyed by various land use activities (e.g., cultivation). These channels are fed by surface water in the spring and following storm events. Some of the intermittent coldwater streams, which have sufficient groundwater input may provide some moderate fish habitat, but again, it is often only on a seasonal basis.

**SUMMARY OF FISH AND AQUATIC HABITAT FINDINGS FOR
WATERCOURSE SEGMENTS LOCATED IN THE HIGHWAY 407 CORRIDOR**

Unit #	Name (Stream Type)	Significance	Comments on Special Features/Sensitivities
AL1900	Rouge River (warmwater migratory)	High	<ul style="list-style-type: none"> • good adult fish habitat (warmwater); potential smallmouth sport fishery • migration route for salmonids • "vulnerable" redds side dace in system, possibly present here
AL1700	Little Rouge Creek (potential coldwater migratory)	high	<ul style="list-style-type: none"> • adult fish habitat (may support brown trout), smallmouth bass • migratory route for salmonids • habitat may be suitable for "vulnerable" redds side dace
AL1794	Unnamed tributary (warmwater intermittent)	Low	
AL1780	Unnamed tributary (warmwater intermittent)	Low	
AL1760	Unnamed tributary (warmwater intermittent)	Low	
AL1761	Unnamed tributary (warmwater intermittent)	Low	
AL1720	Unnamed tributary (warmwater intermittent)	Low	
AL1719	Unnamed tributary (warmwater intermittent)	Low	
AL1670	Petticoat Creek (intermittent warmwater)	Seasonally Moderate	
AL1673	Unnamed tributary (agricultural swale)	Low	
AL1672	Unnamed tributary (agricultural swale)	Low	

TABLE 5.3
SUMMARY OF FISH AND AQUATIC HABITAT FINDINGS FOR
WATERCOURSE SEGMENTS LOCATED IN THE HIGHWAY 407 CORRIDOR

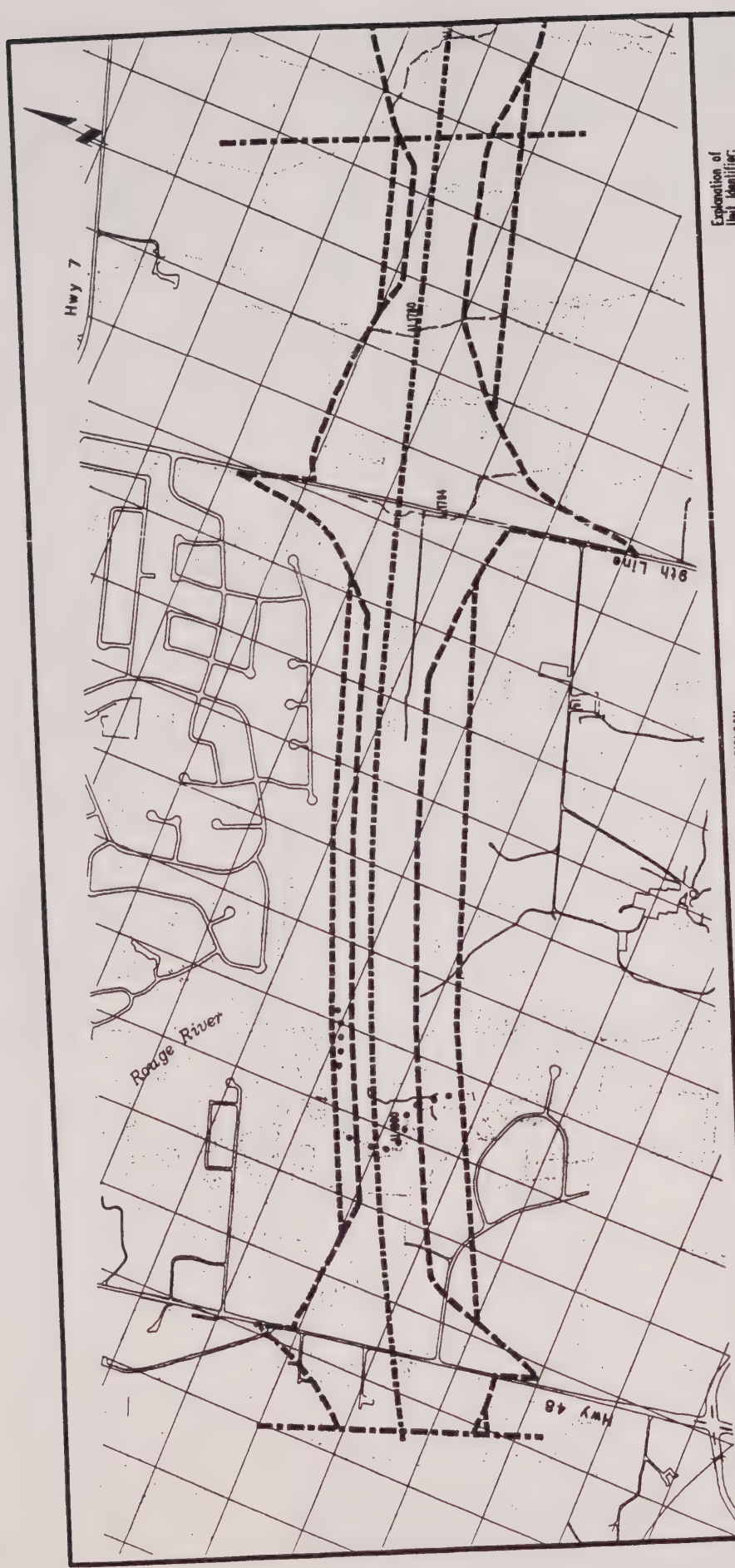
WEST

page 2

Unit #	Name (Stream Type)	Significance	Comments on Special Features/Sensitivities
AL1671	Unnamed tributary (agricultural swale)	low	
AL1652	Unnamed tributary (agricultural swale)	low	
AL1630	West Duffins Creek (coldwater)	high	<ul style="list-style-type: none"> • habitat suitable for resident dace • unstable steep sloping banks; erosion prone (note: redside dace very sensitive to increased turbidity)
AL1631	Unnamed trib. to West Duffins Creek (intermittent coldwater)	seasonally moderate	
AL1610/11	Unnamed trib. to West Duffins Creek (intermittent coldwater)	low	
AL1580	Unnamed tributary (agricultural swale)	low	
AL1570	Unnamed tributary (agricultural swale)	low	
AL1560	Ganetsekiagon Creek (intermittent coldwater)	low	
AL1510	Unnamed tributary (intermittent coldwater)	low	
AL1470	Unnamed tributary (intermittent coldwater)	seasonally moderate	
AL1460	Urfé Creek (intermittent coldwater)	seasonally moderate	
AL1420	Brougham Creek (intermittent coldwater)	seasonally moderate	

TABLE 5.3
SUMMARY OF FISH AND AQUATIC HABITAT FINDINGS FOR
WATERCOURSE SEGMENTS LOCATED IN THE HIGHWAY 407 CORRIDOR

Unit #	Name (Stream Type)	Significance	Comments on Special Features/Sensitivities
AL1400	Spring Creek (intermittent coldwater)	low	
AL1380	Unnamed tributary (coldwater)	high	<ul style="list-style-type: none">• excellent brook/brown trout habitat• good groundwater flow



BASE INFORMATION

- Metch Line
- Centreline of Technically Preferred Route
- Highway 407/Transit Transportation Corridor/
- Terrestrial Biology Study Area

AQUATIC BIOLOGY

- Aquatic Biology Study Area
- Watershed Boundary
- Watercourses (from MTO base data)
- Woodlands (from MTO base data)
- Cold Water Migratory Stream
- Cold Water Stream
- Warm Water Migratory Stream
- Warm Water Stream

- Intermittent Cold Water Stream
- Intermittent Warm Water Stream
- Agricultural Scale
- Pond

Explanation of Unit Identifier:

- eg. T A234 AL057
- T Terrestrial or
- A Aquatic Feature Type
- L Area or
- 1234 Linear Feature Type
- 1357 Unit Number

AQUATIC MAP:

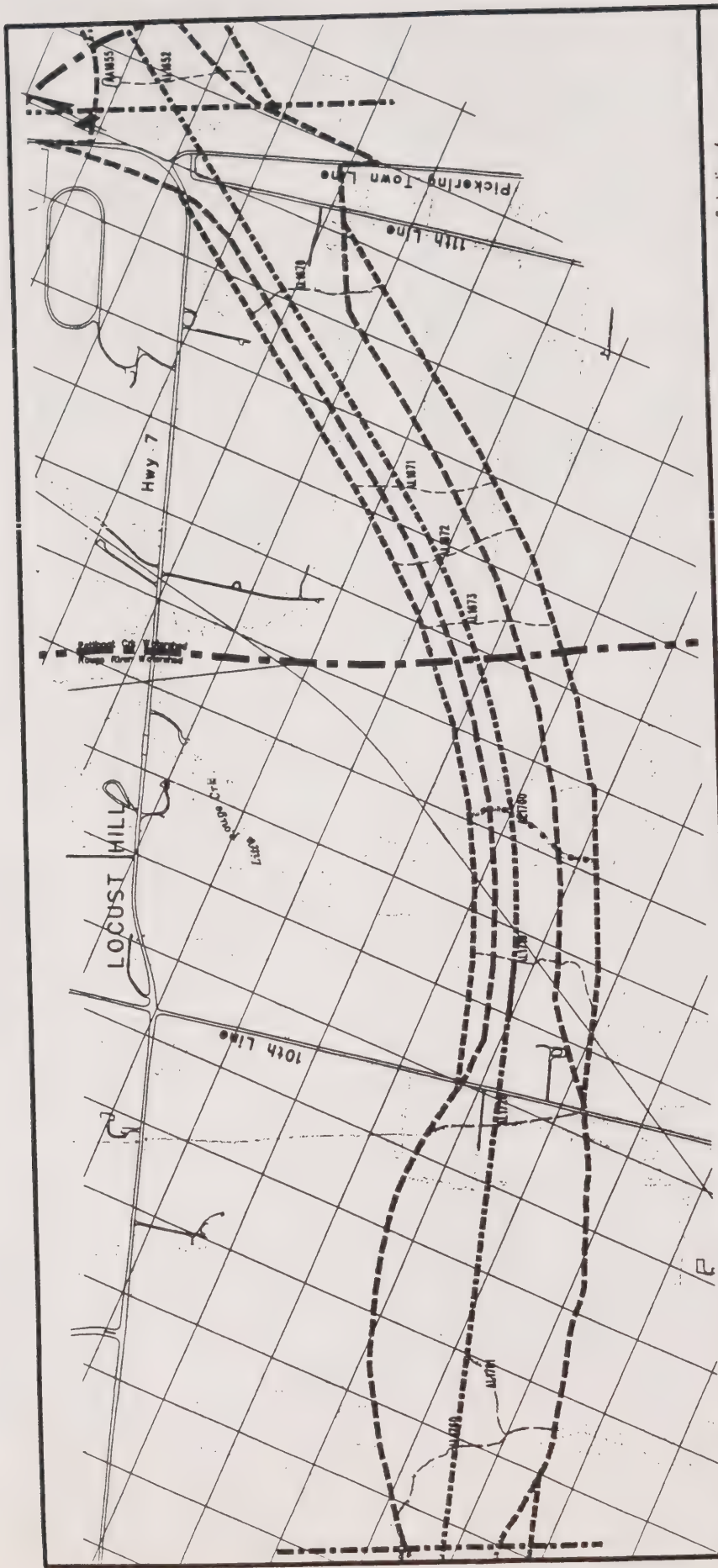
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Detailed Aquatic and Terrestrial
Biological Study -
Highway 407/Transit Transportation
Corridor Technically Preferred Route
Highway 48 - Whitby/Oshawa Boundary



Fenco MacLaren

JUNE 1995



Explanation of Unit Identifier:

eg. T1234
AL1357
T
A
L
1234
1357

Intermittent Cold Water Stream
Intermittent Warm Water Stream
Agricultural Swale
Pond

Cold Water Migratory Stream
Cold Water Stream
Warm Water Migratory Stream
Warm Water Stream

AQUATIC BIOLOGY

Aquatic Biology Study Area
Watershed Boundary
Watercourses (from MTO base data)
Woodlands (from MTO base data)

Match Line
Centreline of Technically Preferred Route
Highway 407/Transit Transportation Corridor/
Terrestrial Biology Study Area

BASE INFORMATION

AQUATIC MAP: 034

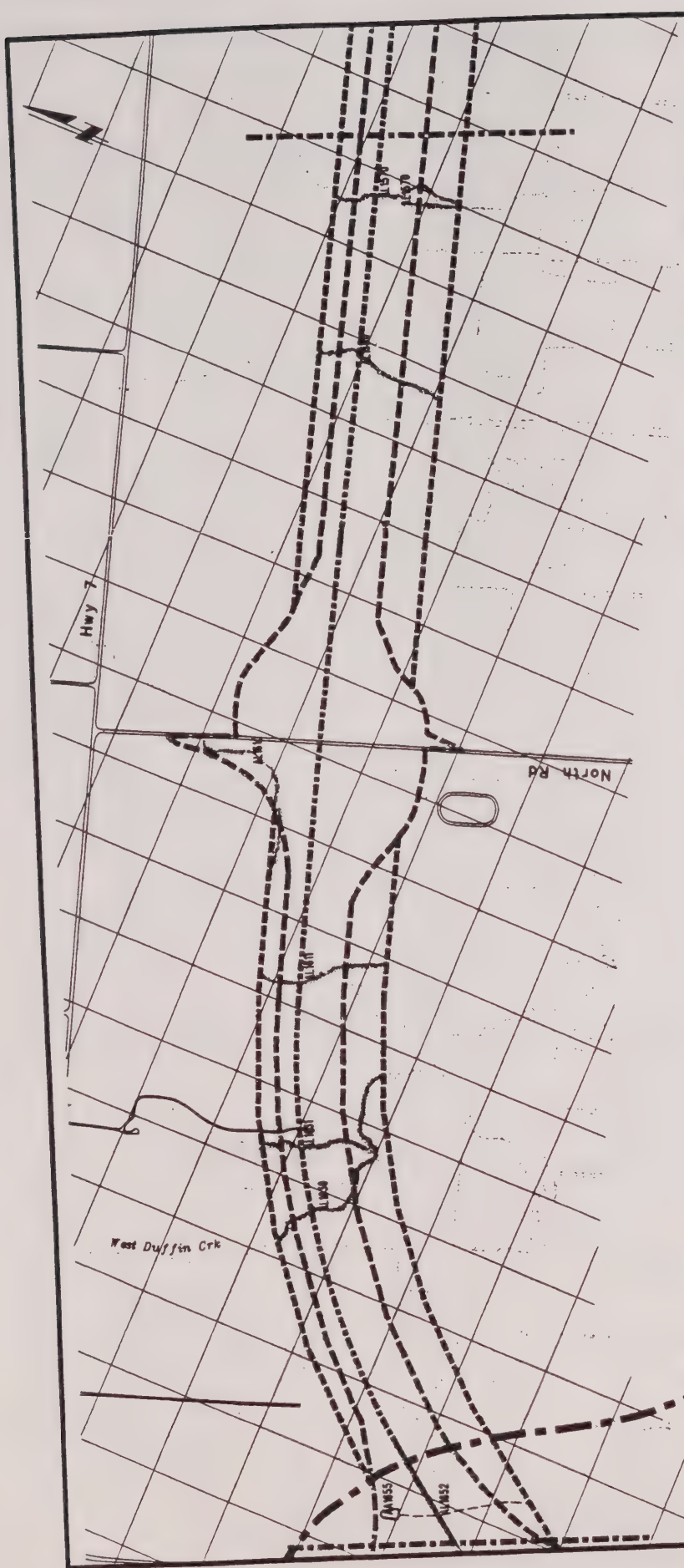
AME 1915

Detailed Aquatic and Terrestrial Biological Study - Highway 407/Transit Transportation Corridor Technically Preferred Route Highway 48 - Whitby/Oshawa Boundary



Fenco MacLaren





Explanation of
Unit Identifier:

eg. T1234
AL1357

T Terrestrial or
A Aquatic Feature Type
L Area or
Linear Feature Type
1234 Unit Number
1357

AQUATIC BIOLOGY

Intermittent Cold Water Stream
Intermittent Warm Water Stream
Agricultural Swale
Pond

Cold Water Migratory Stream
Cold Water Stream
Warm Water Migratory Stream
Warm Water Stream

Aquatic Biology Study Area

Watershed Boundary
Watercourses (from MTO base data)
Woodlands (from MTO base data)

BASE INFORMATION

Mesh Line
Centreline of Technically Preferred Route
Highway 407/Transit Transportation Corridor/
Terrestrial Biology Study Area

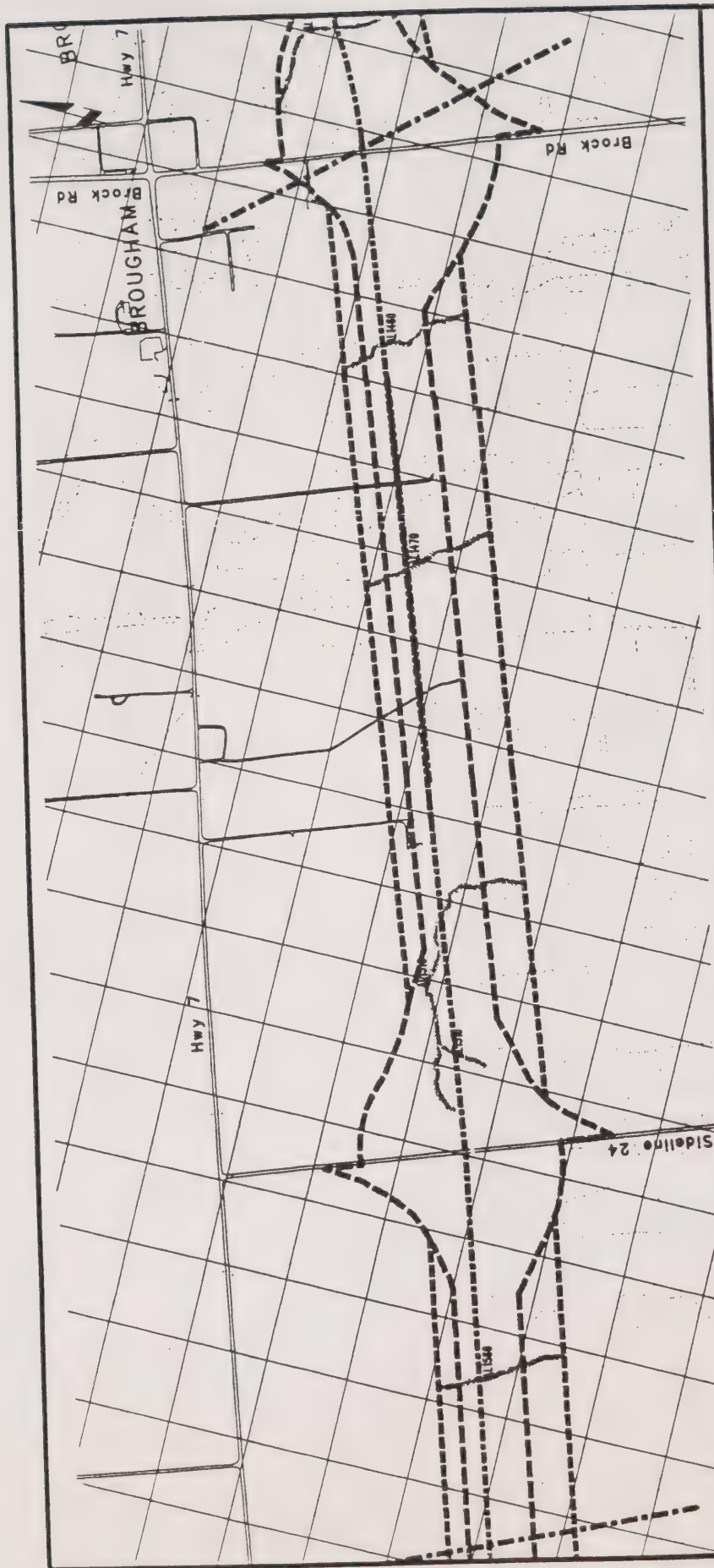
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071

Detailed Aquatic and Terrestrial
Biological Study -
Highway 407/Transit Transportation
Corridor Technically Preferred Route
Highway 48 - Whitby/Oshawa Boundary



Fenco MacLaren



Explanation of Unit Identifier:

eg. TA1234
AL1357
T
A
L
1234
1357
Unit Number

Intermittent Cold Water Stream
Intermittent Warm Water Stream
Agricultural Sacle
Pond

Cold Water Migratory Stream
Cold Water Stream
Warm Water Migratory Stream
Warm Water Stream

AQUATIC BIOLOGY

Aquatic Biology Study Area
Watershed Boundary
Watercourses (from MTO base data)
Woodlands (from MTO base data)

Match Line
Centreline of Technically Preferred Route
Highway 407/Transit Transportation Corridor/
Terrestrial Biology Study Area

AQUATIC MAP:

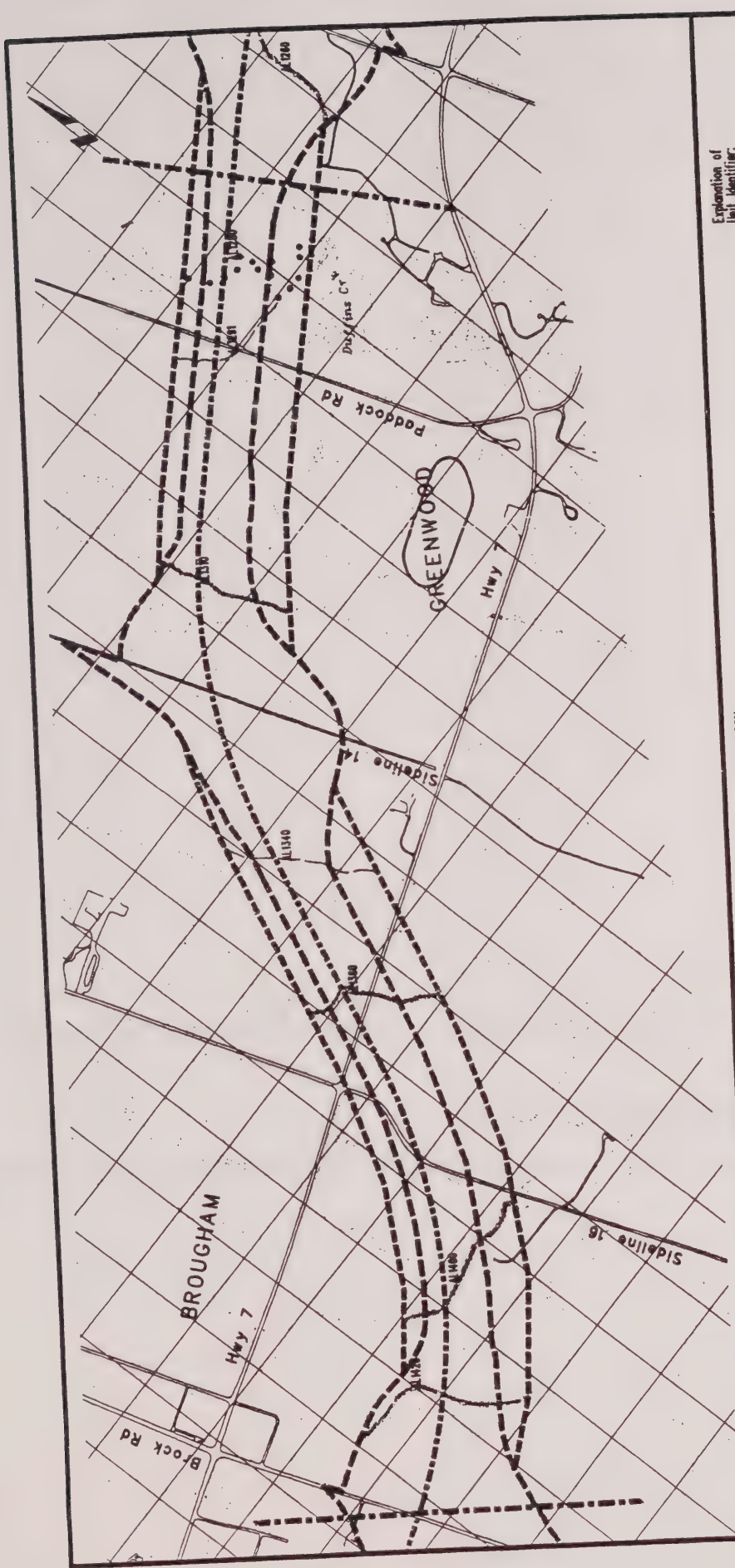
107

JUNE 1995

Detailed Aquatic and Terrestrial
Biological Study -
Highway 407/Transit Transportation
Corridor Technically Preferred Route
Highway 48 - Whitby/Oshawa Boundary

For MacLaren





BASE INFORMATION

- Match Line
- Centreline of Technically Preferred Route
- Highway 407/Transit Transportation Corridor
- Terrestrial Biology Study Area

AQUATIC BIOLOGY

- Aquatic Biology Study Area
- Watershed Boundary
- Watersources (from MTO base data)
- Woodlands (from MTO base data)

- Cold Water Migratory Stream
- Cold Water Stream
- Warm Water Migratory Stream
- Warm Water Stream

- Intermittent Cold Water Stream
- Intermittent Warm Water Stream
- Agricultural Scale
- Pond

Explanation of Unit Identifier:

- | | | |
|-----|--------|----------------------|
| eg. | TA1234 | Terrestrial or |
| | AL357 | Aquatic Feature Type |
| | | Area or |
| | | Linear Feature Type |
| | | Unit Number |
| | | 1234 |
| | | 1357 |

AQUATIC MAP:

147

JUNE 1995

Detailed Aquatic and Terrestrial
Biological Study -
Highway 407/Transit Transportation
Corridor Technically Preferred Route
Highway 48 - Whitby/Oshawa Boundary



Fenco MacLaren



APPENDIX 19.2
1996 FISHERIES INVENTORY

**FISHERIES INVENTORY
FOR HIGHWAY 407
Between Highway 48 and Highway 7 Immediately East of Brock Road**

PREPARED BY:
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Environmental Planner-Fisheries and Wetlands
Ministry of Transportation

PREPARED FOR:
Ministry of Transportation
W.P. 282-88-00

October, 1996

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INTRODUCTION

The Ministry of Transportation (MTO) has been planning and developing the Highway 407 corridor to provide a bypass north of Metropolitan Toronto. A central section of this highway is currently under construction, while an eastern section is approaching the design phase. In the spring of 1994, MTO initiated a natural environment study along the technically preferred route for the Highway 407/Transit Transportation Corridor between Highways 48 and 35/115. Upon completion of this study (Fenco MacLaren Inc., 1995), the Ministry of Natural Resources (MNR) and the Department of Fisheries and Oceans (DFO) expressed concern with some of the fisheries data. As a result, MTO initiated this study which consisted of detailed fish inventory work for all proposed water crossings along the Highway 407 Technically Preferred Route between Highway 48 and Brock Road. At the request of the regulatory agencies (MNR and DFO), this study was conducted to:

- 1) determine the presence/absence of threatened and vulnerable fish species, and if present, estimate their use of existing habitat features;
- 2) determine seasonal use of fisheries habitat at crossing sites where streams have intermittent flow;
- 3) collect fish community data at all proposed water crossing locations.

DATA COLLECTION

A total of 4 permanent streams, 15 intermittent streams, 7 agricultural swales and a pond were assessed by MTO Environmental Staff during the spring and summer of 1996 (Figure 1). For consistency, the stream numbers were adopted from the Fenco MacLaren report (1995). Where possible, the water crossings were sampled with a Smith-Root 12-A backpack electrofisher in the spring for two purposes: 1) to identify any seasonal use of fish habitat in intermittent streams within the Highway 407 study area, and 2) to determine if the vulnerable central stoneroller (*Campostoma anomalum*) or redbside dace (*Clinostomus elongatus*) utilize habitat within the proposed Highway 407 right-of-way (ROW) during spawning season. During the summer, 3 intermittent streams and 4 permanent watercourses were also electrofished to determine the resident fish communities within



FIGURE 1 - STUDY AREA

--- Proposed Highway 407

● Permanent Stream

-●- Intermittent Stream within Right-of-Way

○ Agricultural Swale within Right-of-Way

the study area. In a collaborative effort with MNR, MTO collected detailed fish community information at two of these crossings (West Duffins Creek and a tributary of Duffins Creek, AL1380) using an experimental sampling protocol developed by the MNR (Stanfield and Jones, 1995). These sites which were located both up and down stream of the proposed Highway 407 corridor may eventually be used for long-term monitoring. Additionally, in streams where vulnerable fish species were found, further assessment of habitat was conducted as per the *MTO Procedures for the Identification of the Habitat of Redside Dace, Central Stoneroller, Stonecat, Hornyhead Chub and Atlantic Salmon on Highway 407 Between Highway 48 and Brougham* (Gibson and Mitton-Wilkie, 1996). These procedures were received and accepted in advance by MNR and DFO.

FISHERIES EXISTING CONDITIONS

All 4 of the permanently flowing streams and 3 of the intermittent streams directly support fisheries, while the remaining intermittent streams probably supply water and nutrients to the downstream fisheries. None of the agricultural swales provided fish habitat. All field investigations are summarized in Tables 1, 2 and 3. In addition, photographs taken facing up and down stream from the proposed centre line of all water crossings are displayed in Appendix A. Only streams that directly support a fishery are described below.

Rouge River (AL 1900)

The Rouge River within the study area has been classified as a highly significant stream that supports a resident warmwater fishery with migratory salmonid runs (Fenco MacLaren Inc., 1995); however, it is being managed by MNR as a coldwater fishery. MNR has also expressed concern that the vulnerable reddsides may inhabit this section of stream. A field inventory conducted on July 4, 1996 by MTO revealed the presence of stocked rainbow trout (*Oncorhynchus mykiss*), rock bass (*Ambloplites rupestris*), white sucker (*Catostomus commersoni*) and a variety of cyprinids. Despite extensive sampling, no reddsides were captured. Although reddsides are known to live in the Rouge River approximately 8 km upstream of the study area, the habitat of this stream within the

Table 1: Fish Species in Watercourses with Permanent Flow

Unit #	Name	Date Inspected	Fish Species Present within the Hwy Study Area	Type of Fishery Directly Supported	Significance	Comments
AL 1900	Rouge River	04/07/96	rainbow trout white sucker brassy minnow common shiner bluntnose minnow blacknose dace longnose dace creek chub rock bass johnny darter	Coldwater fishery with migratory salmonids	-High	-no endangered, threatened or vulnerable fish species were observed

Unit #	Name	Date Inspected 24/05/14/06/22/07			Fish Species Present within the Hwy Study Area	Type of Fishery Directly Supported	Significance	Comments
AL 1700	Little Rouge Creek	X	X	X	rainbow trout white sucker hornyhead chub common shiner fathead minnow blacknose dace longnose dace creek chub central stoneroller brown bullhead stonecat rock bass pumpkinseed smallmouth bass rainbow darter lowa darter johnny darter	Warmwater and coldwater fishery with migratory salmonids	-High	-vulnerable central stonerollers inhabit this section of the Little Rouge Creek

Table 1: Fish Species in Watercourses with Permanent Flow (Continued)

Unit #	Name	Date Inspected 24/05/14/06/02/07/18/07 (All in 1996)				Fish Species Present within the Hwy Study Area	Type of Fishery Directly Supported	Significance	Comments
AL 1630	West Duffins Creek	X	X	X	X	white sucker common shiner fathead minnow blacknose dace longnose dace creek chub pumpkinseed rainbow darter johnny darter mottled sculpin	Warmwater and coldwater fishery with migratory salmonids	-High	-barrier to passage just d/s (Whitevale Dam) and u/s of ROW in study area (0.7m) -no endangered, threatened or vulnerable fish species were observed

Unit #	Name	Date Inspected 29/05/96/09/07/96				Fish Species Present within the Hwy Study Area	Type of Fishery Directly Supported	Significance	Comments
AL 1380	Tributary of West Duffins Creek	X	X	X	X	brook trout white sucker northern redbelly dace bluntnose minnow blacknose dace mottled sculpin	Coldwater fishery	-High	-no endangered, threatened or vulnerable fish species were observed

Table 2: Fish Species in Watercourses with Intermittent Flow

Unit #	Name	Date Inspected	Fish Species Present Within the Hwy Study Area	Type of Fishery Directly Supported	Significance	Comments
AL 1794	Tributary of Rouge River	13/05/96	None	None	-Low	
AL 1780	Tributary of Little Rouge Creek	13/05/96	None	None	-Low	-wide and shallow channel with poor fishery potential
AL 1760	Tributary of Little Rouge Creek	14/05/96	None	None	-Low	-poorly defined channel through grassed field with scattered trees and shrubs
AL 1761	Tributary of Little Rouge Creek	14/05/96	None	None	-Low	
AL 1720	Tributary of Little Rouge Creek	13/05/96	None	None	-Low	-wide and shallow channel through grasses ROW with scattered shrubs -instream cover is provided by grasses, cattails, and a few logs -diverse substrate
AL 1719	Tributary of Little Rouge Creek	14/05/96	None	None	-Low	-small channel through grass area scattered with trees -diverse substrate but little instream cover
AL 1670	Pelticoat Creek	22/07/96	None	None	-Low	
AL 1631	Tributary of West Duffins Creek	17/05/96	brook trout white sucker fathead minnow blacknose dace longnose dace creek chub brook stickleback pumpkinseed johnny darter	Coldwater fishery	-High	-no endangered, threatened or vulnerable fish species were observed
AL 1610	Tributary of West Duffins Creek	21/05/96	None	None	-Low	

Table 2: Fish Species in Watercourses with Intermittent Flow (Continued)

Unit #	Name	Date Inspected	Fish Species Present Within the Hoy Study Area	Type of Fishery Directly Supported	Significance	Comments
AL 1611	Tributary of West Duffins Creek	21/05/96	None	None	-Low	
AL 1560	Ganetakingon Creek	21/05/96	None	None	-Low	
AL 1510	Tributary of Duffins Creek	30/05/96	None	None	-Low	-a majority of the tributary is an open channel with little structure, however, the small section of stream through the forest has a diverse morphology and substrate
AL 1470	Tributary of Duffins Creek	29/05/96	brook stickleback	Seasonal warmwater baitfish	-Seasonally Moderate	-small channel with soft substrate, moderate shore and instream cover -no endangered, threatened or vulnerable fish species were observed
AL 1460	Urfé Creek	29/05/96	fathead minnow blacknose dace creek chub	Seasonal warmwater baitfish	-Moderate	-no endangered, threatened or vulnerable fish species were observed
AL 1420	Brougham Creek	05/07/96	None	None	-Low	
AL 1400	Spring Creek	05/07/96	None	None	-Low	

Table 3: Fish Species in Agricultural Swales and Ponds

Unit #	Name	Date Inspected	Fish Species Present Within the Hwy Study Area	Type of Fishery Directly Supported	Significance	Comments
AL 1673	Tributary of Petticoat Creek	14/05/96	None	None	-Low	
AL 1672	Tributary of Petticoat Creek	14/05/96	None	None	-Low	
AL 1671	Tributary of Petticoat Creek	14/05/96	None	None	-Low	
AL 1652	Tributary of Petticoat Creek	17/05/96	None	None	-Low	
AL 1580	Tributary of West Duffins Creek	29/05/96	None	None	-Low	
AL 1570	Tributary of West Duffins Creek	29/05/96	None	None	-Low	
AL 1340	Tributary of Duffins Creek	29/05/96	None	None	-Low	

Unit #	Name	Date Inspected	Fish Species Present Within the Hwy Study Area	Type of Fishery Directly Supported	Significance	Comments
AA1655	Pond	17/05/96	None	Potential Warmwater	-Low	

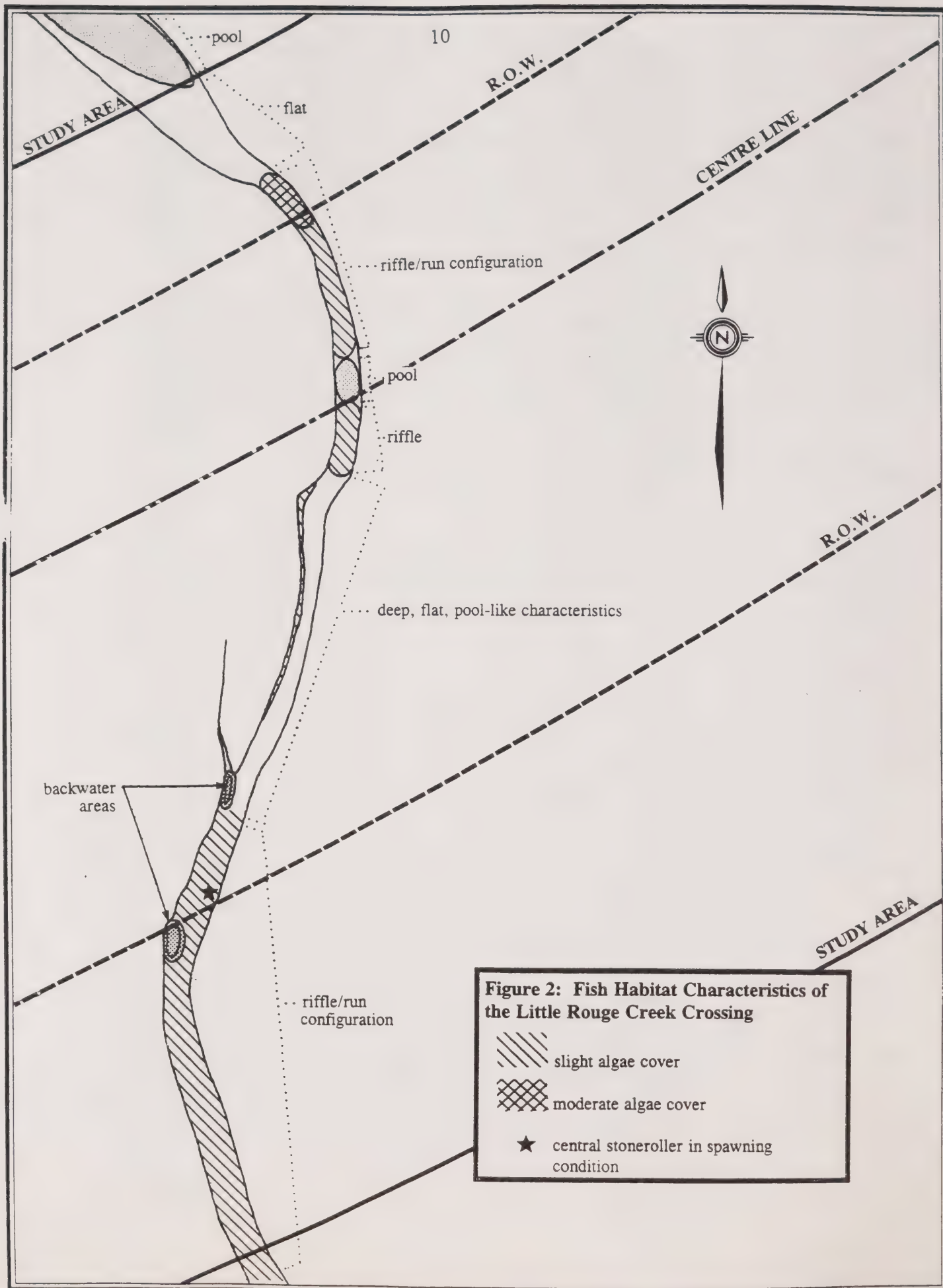
study area does not appear to be appropriate to support this species. For instance, redbase dace are known to inhabit relatively small streams with stream side shade and floodplain grasses (McKee and Parker, 1981; Holm and Crossman, 1986). However, the Rouge River within the study area is a larger stream with limited shade and floodplain grasses.

Because the Rouge River is being managed as a coldwater system and rainbow trout were found within the study area, this water crossing should be classified as supporting a resident coldwater fishery as well as migratory salmonid runs. This fishery has a high level of significance.

Little Rouge Creek (AL 1700)

The Little Rouge River has been classified as a resident warmwater sport fishery with migratory salmonids (Fenco MacLaren Inc., 1996). In addition, the Little Rouge is thought to support the vulnerable redbase dace and central stoneroller. This stream is being managed by MNR as a coldwater system. MTO conducted field inventories 3 times throughout the spring and summer of 1996 (May 24, June 14, July 22). These inventories revealed the presence of rainbow trout, basses and baitfish including the vulnerable central stoneroller. A central stoneroller in spawning condition was captured from a riffle near the downstream limit of the ROW in May. However, in June and July central stonerollers were collected from riffle and run areas throughout the ROW. Despite extensive surveying, redbase dace were not observed within the study area. However, during the spring, smallmouth bass were observed guarding nests within the study area upstream of the ROW.

A central stoneroller in spawning condition was found at one location within the ROW (Figure 2). This stoneroller was captured in mid-May from a riffle at a water temperature of 12 °C. Unfortunately, it was not possible to observe any fish spawning activities within riffles because of the of the extreme water depths and velocities. However, McKee and Parker (1982) reported central stonerollers spawning in mid-May in riffles at water temperatures of 14-16 °C. This indicates that it may be possible for central stonerollers to spawn in the Little Rouge Creek within the Highway 407 ROW.



Because of constraints placed on the location of sampling by MNR, MTO was unable to sample outside of the ROW during spawning season. However, similar habitat is found downstream of the ROW within the study area and within the upstream section of the ROW. Therefore, it may also be possible for central stonerollers to spawn within all the riffle areas. As a result, these areas should be considered important habitat for central stoneroller survival.

Filamentous algae provides the primary food source for central stonerollers (Fowler and Taber, 1985; McAllister, 1987; McKee and Parker, 1981; Mundahl and Ingersoll, 1989). Therefore, the areas of filamentous algae within the study area was assessed in both 1995 (Fenco MacLaren Inc., 1995) and 1996 (Figure 2). The growth of algae appears to vary slightly from year to year. In 1995, approximately 50 % of the substrate within the ROW was slightly to moderately covered with algae. Additionally in 1995, within the study area upstream of the ROW approximately 80% of the substrate was overlaid with algae, while downstream there was no significant amount of algal growth. However, in 1996, approximately 20 % of the substrate within the ROW was slightly covered with algae, while approximately 45 % of the substrate downstream of the ROW was slightly covered in algae. In 1996, the greatest amount of algal growth occurred in a small area at the upstream edge of the ROW, while the remainder of the upstream section had no significant algal growth. Despite the variability between years the best feeding habitat appears to be in riffle/run configurations either up or downstream of the Highway 407 ROW. In addition, central stonerollers rely on pools, backwater areas and vegetated riffles for cover. Within the study area there were two backwater areas: one at the downstream edge of the ROW and one at the side channel within the lower section of the ROW (Figure 2). However, central stonerollers were only captured from the backwater area downstream of the ROW. Within the ROW there was also a pool and a large deep flat/shallow pool-like area, however, no central stonerollers were captured from either of these locations.

The field work conducted during 1996 confirmed the classification for Little Rouge Creek as supporting resident coldwater and warmwater fish species including central stonerollers. This fishery has a high level of significance. Therefore, in order to minimize the impacts of highway construction on this fishery, important habitat for central stonerollers should not be altered; such habitat consists of the run/riffle areas which provide areas for both spawning and feeding and the backwater area that provides cover. Because similar riffle/run habitats occur both up and downstream of the Highway 407 ROW, this habitat should not be considered critical.

West Duffins Creek (AL 1630)

In the vicinity of the Highway 407 corridor, West Duffins Creek is thought to support both warmwater and coldwater sportfish species and potentially reddsides. Fenco MacLaren Inc. (1995) has classified this stream as supporting a highly significant fishery. In addition, Atlantic salmon (*Salmo salar*) were introduced into Duffins Creek in 1995 in an attempt to establish a lake run population. During the spring and summer of 1996, MTO conducted species inventories 4 times (May 24, June 14, July 2 and July 18). Only warmwater species were captured within the highway ROW (white sucker, pumpkinseed (*Lepomis gibbosus*), and various baitfish). However, a mottled sculpin (*Cottus bairdi*) was captured upstream of the ROW. Again, despite extensive surveying, no reddsides were observed. This work confirms the classification for West Duffins Creek reported in the Fenco MacLaren report (1995) as supporting a highly significant warmwater sport fishery and having the potential to also support coldwater sportfish species. However, reddsides do not inhabit this section of stream.

Tributary of Duffins Creek (AL 1380)

This tributary of Duffins Creek, often called Brougham Creek, supports a diverse coldwater fish community dominated by brook trout (*Salvelinus fontinalis*). This community also consists of white sucker, mottled sculpin and various minnow species. Despite intense surveys of this site, reddsides were not observed. These observations are consistent with the highly significant coldwater sport fish classification provided for this stream in the Fenco MacLaren report (1995).

Tributary to West Duffins Creek (AL 1631)

This intermittent tributary to West Duffins Creek dries into isolated pools during dry summers (i.e. 1995). Therefore, the stream was classified as intermittent coldwater with a seasonally moderate significance (Fenco MacLaren, 1995). However, during the early summer of 1996, the stream maintained a significant flow and supported a diverse fish community including brook trout, pumpkinseed, white suckers, darters and minnows. Therefore, based on 1996 water flow and species information, this tributary to Duffins Creek should be re-classified as a coldwater fishery with a high significance.

Tributary to Duffins Creek (AL 1470)

This stream is a small intermittent tributary to Duffins Creek that has a soft substrate and is comprised mostly of runs and flats. Moderate instream cover is provided by logs and grasses while grasses and deciduous trees provide cover from shore. This stream provides seasonal habitat for two common warmwater baitfish species: brook stickleback (*Culaea inconstans*) and fathead minnows (*Pimephales promelas*). Therefore, the reach of this tributary within the Highway 407 corridor provides seasonal warmwater habitat with seasonally moderate significance.

Urfé Creek (AL 1460)

Urfé Creek is an intermittent tributary of Duffins Creek which was classified as an intermittent coldwater stream of seasonally moderate significance (Fenco MacLaren Inc., 1995). Although the stream does not maintain a permanent flow, it does provide habitat throughout the year in isolated pools. Within the Highway 407 study area this stream supports a community of three common baitfish species: blacknose dace (*Rhinichthys atratulus*), creek chub (*Semotilus atromaculatus*) and fathead minnows. Because Urfé Creek provides habitat throughout the year, it should be classified as a warmwater baitfish stream of moderate significance.

SUMMARY

In the *Highway 407 Detailed Aquatic and Terrestrial Biological Study Report* (Fenco MacLaren Inc., 1995) assumptions were made regarding the type and significance of fisheries at each proposed highway crossing. These assumptions were based on the available existing fish inventory information for the waterbody and the fish habitat at each site. However, as a result of the fisheries inventories conducted in 1996 within the Highway 407 study area between Highway 48 and Brock Road, stream classifications can be clarified and updated.

All 4 of the watercourses with permanent flow support highly significant fisheries. However, none of these streams within the study area support the vulnerable reidside dace. The Rouge River supports a coldwater fishery with migratory salmonids. The Little Rouge Creek supports a diverse community of both warmwater and coldwater sportfish including central stonerollers. Within the Highway 407 study area, the stream provides spawning, feeding and cover habitat for this vulnerable species. Little Rouge Creek also supports migratory runs of salmonids. West Duffins Creek supports warmwater and coldwater fisheries within the Highway 407 study area. The fourth permanent watercourse is a tributary of Duffins Creek (AL1380). This stream supports a resident coldwater fishery.

Of the 15 intermittent tributaries within the study area, only 3 directly support fish communities. The unnamed tributary of West Duffins Creek (AL 1631), supports a highly significant coldwater fishery throughout most of the year. However, this stream does dry into isolated pools during dry summers. Urfé Creek also dries into isolated pools during the summer. However, this stream provides habitat throughout the year for warmwater baitfish and has a moderate significance. The final stream that directly supports a fish community is a tributary of Duffins Creek (AL 1470). This stream provides seasonal habitat for warmwater baitfish and has a seasonally moderate significance.

All of the other intermittent tributaries within the Highway 407 corridor do not directly support fisheries however, they may provide water and nutrients to downstream fisheries. Therefore, all of these tributaries have been classified as having a low sensitivity. Finally, the 7 agricultural swales have no fisheries potential.

FUTURE WORK

This study meets the full fisheries field study requirements of the regulatory agencies (MNR and DFO). It provides current, complete fisheries data with which to proceed into the design phase of Highway 407. This data, in combination with the Fenco MacLaren report (1995), will be used to assess the potential impacts of highway design alternatives on fisheries and to determine appropriate mitigation measures. During this phase, design considerations should include opportunities to mitigate fisheries impacts at stream crossings through the use of spanning and open footing structures as well as through stormwater management. In addition to fisheries, the design of crossing structures should consider other natural features such as wild life corridors and ground water upwelling.

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APPENDIX A: PHOTOGRAPHS

LIST OF PHOTOGRAPHS

1-2	AL 1900, Rouge River
3-4	AL 1794, Tributary of the Rouge River
5-6	AL 1780, Tributary of Little Rouge Creek
7-8	AL 1761, Tributary of Little Rouge Creek
9-10	AL 1760, Tributary of Little Rouge Creek
11-12	AL 1720, Tributary of Little Rouge Creek
13-14	AL 1719, Tributary of Little Rouge Creek
15-16	AL 1700, Little Rouge Creek
17-18	AL 1673, Agricultural Swale
19-20	AL 1672, Agricultural Swale
21-22	AL 1671, Agricultural Swale
23-24	AL 1670, Petticoat Creek
25-26	AA 1655, Pond
27-28	AL 1652, Agricultural Swale
29-30	AL 1631, Tributary of West Duffins Creek
31-32	AL 1630, West Duffins Creek
33-34	AL 1611, Tributary of West Duffins Creek
35-36	AL 1610, Tributary of West Duffins Creek
37-38	AL 1580, Agricultural Swale
39-40	AL 1570, Agricultural Swale
41-42	AL 1560, Ganetsekiagon Creek
43-44	AL 1510, Tributary of Duffins Creek
45-46	AL 1470, Tributary of Duffins Creek
47-48	AL 1460, Urfé Creek
49-50	AL 1420, Brougham Creek
51-52	AL 1400, Spring Creek
53-54	AL 1380, Tributary of Duffins Creek
55-56	AL 1340, Agricultural Swale



PHOTO 1: Rouge River AL 1900 (upstream)



PHOTO 2: Rouge River AL 1900 (downstream)



PHOTO 3: Tributary of the Rouge River AL 1794 (upstream)



PHOTO 4: Tributary of the Rouge River AL 1794 (downstream)



PHOTO 5: Tributary of Little Rouge Creek AL 1780 (upstream)



PHOTO 6: Tributary of Little Rouge Creek AL 1780 (downstream)



PHOTO 7: Tributary of Little Rouge Creek AL 1761 (upstream)



PHOTO 8: Tributary of Little Rouge Creek AL 1761 (downstream)



PHOTO 9: Tributary of Little Rouge Creek AL 1760 (upstream)



PHOTO 10: Tributary of Little Rouge Creek AL 1760 (downstream)



PHOTO 11: Tributary of Little Rouge Creek AL 1720 (upstream)



PHOTO 12: Tributary of Little Rouge Creek AL 1720 (downstream)



PHOTO 13: Tributary of Little Rouge Creek AL 1719 (upstream)



PHOTO 14 : Tributary of Little Rouge Creek AL 1719 (downstream)



PHOTO 15: Little Rouge Creek AL 1700 (upstream)



PHOTO 16: Little Rouge Creek AL 1700 (downstream)



PHOTO 17: Agricultural Swale AL 1673 (upstream)



PHOTO 18: Agricultural Swale AL 1673 (downstream)



PHOTO 19: Agricultural Swale AL 1672 (upstream)



PHOTO 20: Agricultural Swale AL 1672 (downstream)



PHOTO 21: Agricultural Swale AL 1671 (upstream)



PHOTO 22: Agricultural Swale AL 1671 (downstream)



PHOTO 23: Petticoat Creek AL 1670 (upstream)



PHOTO 24: Petticoat Creek AL 1670 (downstream)



PHOTO 25: Pond AA 1655 (north of ROW)



PHOTO 26: Pond AA 1655 (north of ROW)



PHOTO 27: Agricultural Swale AL 1652 (upstream)



PHOTO 28: Agricultural Swale AL 1652 (downstream)



PHOTO 29: Tributary of West Duffins Creek AL 1631 (upstream)



PHOTO 30: Tributary of West Duffins Creek AL 1631 (downstream)



PHOTO 31: West Duffins Creek AL 1630 (upstream)



PHOTO 32: West Duffins Creek AL 1630 (downstream)



PHOTO 33: Tributary of West Duffins Creek AL 1611 (upstream)



PHOTO 34: Tributary of West Duffins Creek AL 1611 (downstream)



PHOTO 35: Tributary of West Duffins Creek AL 1610 (upstream)



PHOTO 36: Tributary of West Duffins Creek AL 1610 (downstream)



PHOTO 37: Agricultural Swale AL 1580 (upstream)



PHOTO 38: Agricultural Swale AL 1580 (downstream)



PHOTO 39: Agricultural Swale AL 1570 (upstream)



PHOTO 40: Agricultural Swale AL 1570 (downstream)



PHOTO 41: Ganetsekiagon Creek AL 1560 (upstream)



PHOTO 42: Ganetsekiagon Creek AL 1560 (downstream)



PHOTO 43: Trib. of Duffins Creek AL 1510 (upstream)



PHOTO 44: Trib. of Duffins Creek AL 1510 (downstream)



PHOTO 45: Tributary of Duffins Creek AL 1470 (upstream)



PHOTO 46: Trib. of Duffins Creek AL 1470 (downstream)



PHOTO 47: Urfé Creek AL 1460 (upstream)

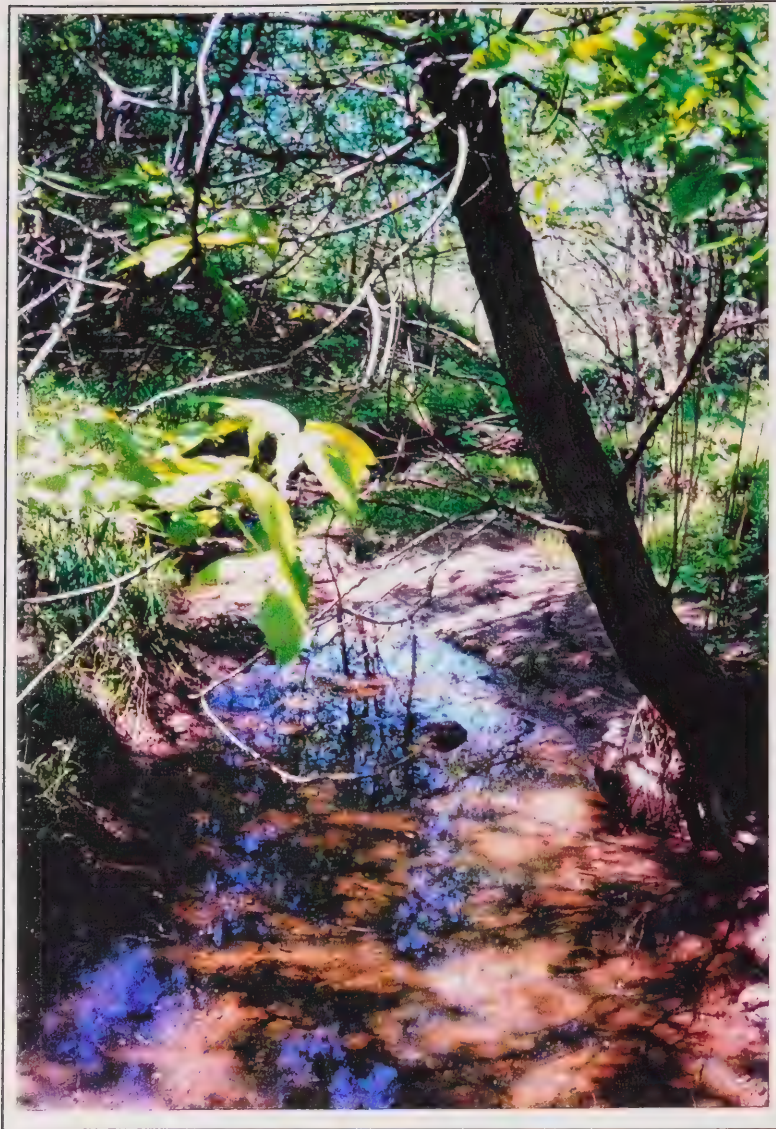


PHOTO 48: Urfé Creek AL 1460 (downstream)



PHOTO 49: Brougham Creek AL 1420 (upstream)



PHOTO 50: Brougham Creek AL 1420 (downstream)



PHOTO 51: Spring Creek AL 1400 (upstream)



PHOTO 52: Spring Creek AL 1400 (downstream)



PHOTO 53: Trib. of Duffins Creek AL 1380 (upstream)



PHOTO 54: Trib. of Duffins Creek AL 1380 (downstream)



PHOTO 55: Agricultural Swale AL 1340 (upstream)



PHOTO 56: Agricultural Swale AL 1340 (downstream)

APPENDIX 20
TERRESTRIAL ENVIRONMENT AFFECTED
BY THE TECHNICALLY PREFERRED ROUTE

NOTE TO THE READER

The following is an excerpt from Vegetation & Wildlife (Terrestrial Biology) Section of the Detailed Aquatic and Terrestrial Biological Study completed by Fenco MacLaren Inc. in 1995. Although the report covers the entire technically preferred route determined through the Route Planning Study from Highway 48 (Markham Road) to the Whitby/Oshawa Boundary, only those sections that are relevant to the portion of Highway 407/Transitway between Markham Road and Highway 7 east of Brock Road, have been included here. Pages 35-58 of the original report are not provided here because they dealt with the route east of the study limits of this undertaking.

This report was reviewed by MNR and MTRC and several improvements were suggested. These improvements have been taken into account in the main body of this EA Report. The comments will be considered further as part of the Stakeholder Consultation Process.

The field notes (referred to as Appendix 2 in this Appendix) have not been included here. They are available to review agencies upon request.

(West)

6.0 VEGETATION & WILDLIFE (TERRESTRIAL BIOLOGY)

6.1 Introduction

The findings of the terrestrial biology portion of the study are presented below in the form of descriptions of terrestrial units (Table 6.1.1). These descriptions are intended to reflect the essential character of each unit and to point out obvious sensitivities and significant elements (see Section 2.5). The unit descriptions are complemented by detailed data records (see Volume 2) for each unit. In keeping with the somewhat general nature of the unit descriptions, generic common names are often used (e.g., willows and sedges). This is done mainly for convenience and in most cases, the species are found in the data record.

The more complex systems are described in greater detail and often several related units in these systems are described together (e.g., Units 1810-1813 - Rouge River Valley). Some features are very similar, e.g., mature upland deciduous forest units tend to be similar, therefore, these units usually will be described briefly. The same holds true for old-fields and hedgerows, but this is not to suggest that these features are not important. The essential character of mature upland deciduous forests, old-fields, hedgerows, and succession shrubland/woodland is described below. When these terms are used without much elaboration in the unit descriptions, it is because they are described here, rather than repetitively for each unit. Especially important features/issues that are unique to a given unit of deciduous forest, old-field, etc. are discussed in the unit description.

Mature Upland Deciduous Forests - these are forests on generally well drained areas with the average composition in the area of the corridor being sugar maple (60%), beech (17%), and basswood, white ash, and hemlock accounting for most of the rest of the difference; average age and height of these stands is over 80 years and 20 m, respectively (OMNR-FRI, 1978). Diameter (dbh) may vary considerably with density, soil conditions and past land use. In addition to seedling regeneration of the dominant species, some, but usually relatively few, shrubs are present. Chokecherry and alternate-leaved dogwood are two common components of the shrub stratum. Herbaceous plants generally fall into three categories: 1) spring flowering monocots and dicots, 2) ferns which generally maintain leaves throughout much of the year, and 3) some grasses and sedges.

Vertebrate wildlife commonly includes raccoons and grey squirrels, and white-tailed deer may use these woodlands for cover and browse. These are important systems for a number of

TABLE 6.1.1
LIST OF TERRESTRIAL UNITS - WEST

UNIT	UNIT TYPE	WATERSHED	WATERSHED CODE	GIS MAP REF	REGIONAL MUNICIPALITY	MUNICIPALITY	LOT	CON-CESSION
TA1814	Hedgerow	Rouge River	2HC-9	000	York Region	Town of Markham	8	8
TA1813	Woodland	Rouge River	2HC-9	000	York Region	Town of Markham	8	8
TA1812	Woodland	Rouge River	2HC-9	000	York Region	Town of Markham	8	8
TA1811	Floodplain	Rouge River	2HC-9	000	York Region	Town of Markham	8	8
TA1810	Woodland	Rouge River	2HC-9	000	York Region	Town of Markham	8	8
TA1807	Coniferous Woodland	Rouge River	2HC-9	000	York Region	Town of Markham	8	8
TA1806	Coniferous Woodland	Rouge River	2HC-9	000	York Region	Town of Markham	8	8
TA1805	Shrubland	Rouge River	2HC-9	000	York Region	Town of Markham	8	8
TA1801	Oldfield	Rouge River	2HC-9	000	York Region	Town of Markham	8	8
TA1800	Mixed Woodland	Rouge River	2HC-9	000	York Region	Town of Markham	8	8
TA1798	Hedgerow	Rouge River	2HC-9	000	York Region	Town of Markham	8	9
TA1796	Oldfield	Rouge River	2HC-9	000	York Region	Town of Markham	9	9
TA1793	Residential Vegetation	Rouge River	2HC-9	000	York Region	Town of Markham	9	9
TA1792	Wetland	Rouge River	2HC-9	000	York Region	Town of Markham	9	9
TA1791	Woodland	Rouge River	2HC-9	000	York Region	Town of Markham	9	9
TA1790	Old-field/Shrubland	Rouge River	2HC-9	000	York Region	Town of Markham	9	9
TA1770	Hedgerow	Rouge River	2HC-9	000	York Region	Town of Markham	9	9
TA1752	Hedgerow	Rouge River	2HC-9	034	York Region	Town of Markham	9	9
TA1751	Shrubland	Rouge River	2HC-9	034	York Region	Town of Markham	9	9
TA1740	Wetland	Rouge River	2HC-9	034	York Region	Town of Markham	9	9
TA1730	Mixed Woodland/Drainage	Rouge River	2HC-9	034	York Region	Town of Markham	8	9
TA1715	Hedgerow	Rouge River	2HC-9	034	York Region	Town of Markham	8	10
TA1714	Hedgerow	Rouge River	2HC-9	034	York Region	Town of Markham	8	10
TA1712	Mixed Woodland	Rouge River	2HC-9	034	York Region	Town of Markham	8	10
TA1711	Coniferous Woodland	Rouge River	2HC-9	034	York Region	Town of Markham	8	10
TA1697	Oldfield	Rouge River	2HC-9	034	York Region	Town of Markham	9	10
TA1691	Hedgerow	Petticoast Creek	2HC-9	034	York Region	Town of Markham	9	10
TA1800	Hedgerow	Petticoast Creek	2HC-9	034	York Region	Town of Markham	10	10
TA1681	Hedgerow	Petticoast Creek	2HC-9	034	York Region	Town of Markham	10	10
TA1680	Plantation	Petticoast Creek	2HC-9	034	York Region	Town of Markham	10	10
TA1671	Oldfield	Petticoast Creek	2HC-9	034	Durham Region	Town of Pickering	35	5
TA1661	Shrubland	Petticoast Creek	2HC-9	034	York Region	Town of Markham	10	10
TA1660	Deciduous Woodland	Petticoast Creek	2HC-9	034	Durham Region	Town of Pickering	35	5
TA1653	Old-field	Petticoast Creek	2HC-9	071	Durham Region	Town of Pickering	35	5
TA1651	Hedgerow	Petticoast Creek	2HC-9	071	Durham Region	Town of Pickering	35	5
TA1650	Hedgerow	Petticoast Creek	2HC-9	071	Durham Region	Town of Pickering	35	5
TA1645	Hedgerow	Duffins Creek	2HC-10	071	Durham Region	Town of Pickering	34	5
TA1642	Oldfield	Duffins Creek	2HC-10	071	Durham Region	Town of Pickering	33	5
TA1641	Mixed Woodland	Duffins Creek	2HC-10	071	Durham Region	Town of Pickering	33	5
TA1640	Mixed Woodland	Duffins Creek	2HC-10	071	Durham Region	Town of Pickering	33	5
TA1622	Oldfield	Duffins Creek	2HC-10	071	Durham Region	Town of Pickering	32	5
TA1620	Oldfield	Duffins Creek	2HC-10	071	Durham Region	Town of Pickering	32	5
TA1615	Hedgerow	Duffins Creek	2HC-10	071	Durham Region	Town of Pickering	32	5
TA1600	Mixed Woodland	Duffins Creek	2HC-10	071	Durham Region	Town of Pickering	31	5
TA1590	Hedgerow	Duffins Creek	2HC-10	071	Durham Region	Town of Pickering	28	5
TA1550	Mature Upland Deciduous Forest	Duffins Creek	2HC-10	107	Durham Region	Town of Pickering	25	5
TA1545	Hedgerow	Duffins Creek	2HC-10	107	Durham Region	Town of Pickering	25	5
TA1540	Old-field	Duffins Creek	2HC-10	107	Durham Region	Town of Pickering	25	5
TA1530	Wetland	Duffins Creek	2HC-10	107	Durham Region	Town of Pickering	24	5
TA1525	Old-field	Duffins Creek	2HC-10	107	Durham Region	Town of Pickering	24	5
TA1520	Lowland Deciduous Woodland	Duffins Creek	2HC-10	107	Durham Region	Town of Pickering	24	5
TA1508	Hedgerow	Duffins Creek	2HC-10	107	Durham Region	Town of Pickering	23	5
TA1506	Hedgerow	Duffins Creek	2HC-10	107	Durham Region	Town of Pickering	23	5
TA1502	Hedgerow	Duffins Creek	2HC-10	107	Durham Region	Town of Pickering	23	5
TA1501	Deciduous Woodland	Duffins Creek	2HC-10	107	Durham Region	Town of Pickering	23	5

TABLE 6.1.1
LIST OF TERRESTRIAL UNITS - WEST

UNIT	UNIT TYPE	WATERSHED	WATERSHED CODE	GIS MAP REF	REGIONAL MUNICIPALITY	MUNICIPALITY	LOT	CON-CESSION
TA1500	Deciduous Woodland	Duffins Creek	2HC-10	107	Durham Region	Town of Pickering	23	5
TA1490	Hedgerow	Duffins Creek	2HC-10	107	Durham Region	Town of Pickering	22	5
TA1485	Oldfield/Shrubland	Duffins Creek	2HC-10	107	Durham Region	Town of Pickering	22	5
TA1484	Gravel Quarry Wetland	Duffins Creek	2HC-10	107	Durham Region	Town of Pickering	22	5
TA1483	Mixed Woodland	Duffins Creek	2HC-10	107	Durham Region	Town of Pickering	21	5
TA1482	Mixed Woodland	Duffins Creek	2HC-10	107	Durham Region	Town of Pickering	21	5
TA1481	Mixed Woodland	Duffins Creek	2HC-10	107	Durham Region	Town of Pickering	21	5
TA1480	Shrubland/Woodland	Duffins Creek	2HC-10	107	Durham Region	Town of Pickering	21	5
TA1450	Mixed Woodland/Floodplain	Duffins Creek	2HC-10	107	Durham Region	Town of Pickering	20	5
TA1440	Hedgerow	Duffins Creek	2HC-10	107	Durham Region	Town of Pickering	19	5
TA1430	Hedgerow	Duffins Creek	2HC-10	107	Durham Region	Town of Pickering	19	5
TA1410	Mixed Woodland	Duffins Creek	2HC-10	147	Durham Region	Town of Pickering	18	5
TA1391	Hedgerow	Duffins Creek	2HC-10	147	Durham Region	Town of Pickering	19	5
TA1390	Old-field/Shrubland	Duffins Creek	2HC-10	147	Durham Region	Town of Pickering	17	5
TA1385	Hedgerow	Duffins Creek	2HC-10	147	Durham Region	Town of Pickering	17	5
TA1370	Mixed Woodland	Duffins Creek	2HC-10	147	Durham Region	Town of Pickering	18	5
TA1360	Mixed Woodland	Duffins Creek	2HC-10	147	Durham Region	Town of Pickering	16	6

migrating and resident birds. Dead and dying trees, natural phenomena in mixed-age mature deciduous forests, may provide habitat for a number of hole-dwelling species such as flying squirrels and woodpeckers.

Old-fields - these are relatively open systems with a somewhat characteristic herbaceous flora comprising introduced forage grasses (e.g., Kentucky bluegrass, Canada bluegrass, orchard grass, timothy, quack grass, smooth brome grass, redtop and meadow fescue). In more disturbed areas, pioneer species such as butter-and-eggs, dandelions, sweet white clover, St. John's wort, and Queen Anne's lace may be present. The perennial asters and goldenrods abound in mature old-fields. These are transitional (successional) systems which, if left undisturbed, become shrubland and eventually forest. It is not uncommon then to find shrubs and small trees associated with old-fields. Red- osier dogwood and small white cedar are common shrubs in moist old-fields, and hawthorns are common in better drained situations.

The vertebrate fauna of old fields includes meadow voles in most situations, and their primary predator, the short-tailed weasel. Woodchucks are common, and deer may browse in old-fields. There are a number of bird species that are specific to old-field habitat including bobolink, meadowlark, and savannah sparrow. Meadow vole is an important prey item of a number of raptors, including red-tailed hawk. Northern harrier nests in old-fields and preys heavily on meadow voles.

Hedgerows - the categories used to describe hedgerows are self-explanatory, and follow the convention of Gore and Storrie (1992-93). The are:

- 1) Native hardwood trees, with sugar maple and basswood usually the most abundant species.
- 2) Native coniferous trees, usually white cedar.
- 3) Planted trees, with Norway spruce and Norway Maple the most common species.
- 4) Shrubs, with hawthorns and apple the most common.

Successional Shrubland/Woodland - These are systems dominated by shrubs and successional tree species of various ages. These are successional communities that, if left undisturbed, will eventually become mature forests with a species composition that will persist for the foreseeable future. Depending on the circumstances, various mixtures of such species as red-osier dogwood,

hawthorns, white cedar, trembling aspen, balsam poplar, white pine and white birch can be expected.

6.2 Description and Assessment

6.2.1 Rouge River Watershed

The length of the corridor in this watershed is 5.5 km. The R.O.W. encroaches on the following areas (ha) in each of the respective major habitat types: woodland (6.6), wetland (0.7), old-field (1.6), old-field/shrubland (1.6), shrubland (4.1), residential (0.9), hedgerow (1.2), and plantation (0.0). For the most part, residential vegetation was not evaluated, but in some places, where it was deemed sufficiently "natural" and otherwise relevant to the discussion, it was considered. In total, 26 terrestrial units are encroached on by the R.O.W. within the Rouge River Watershed (see Maps 000 and 034 at the end of this section).

Unit 1814 - Hedgerow

Unit 1814 includes a north-south hedgerow at the top of the west bank of the Rouge River Valley system and an adjoining east-west hedgerow extending westward. The R.O.W. encroaches on 0.3 ha of this unit.

The north-south element has amalgamated somewhat with the bank vegetation of Unit 1813. The dominant tree vegetation in the north-south element is white pine. Red pine is relatively abundant where the two elements join and in the westward extension. Overall, the approximate abundances of the dominant are white pine (35%), red pine (30%) and Manitoba maple (20%). Shrub and herbaceous vegetation is generally that of edges, old-fields and pioneer environments.

Much of this unit is effectively part of the Rouge River Valley system, and, as such, contributes to an important corridor.

No Rare plants or Significant wildlife were observed directly in this unit.

Units 1810-1813 - Rouge River Valley System (Woodland/Floodplain)

Units 1810 to 1813 are shown on Map 000. Unit 1813 is the steep, somewhat unstable west slope of the Rouge River system. Unit 1812 includes the floodplain at the base of the west slope and the entire west bank of the river. Unit 1811 is the east shoreline of the river. Unit 1810 includes a broadly terraced "peninsula" east of Unit 1811 formed by a bend in the river where the R.O.W. crosses the river immediately north of the IBM golf course. Collectively, the R.O.W. encroaches on 3.2 ha of this system.

The west bank is dominated by a community of common deciduous tree species containing large, mature specimens of sugar maple and white ash. A linear wetland area, formed by an abandoned stream channel parallel to the river proper, but separated from it by a low natural levee, is characterized by white cedar, Manitoba maple, some large red ash, and herbaceous species such as touch-me-not and moneywort. The levee is dominated mainly by white cedar with some deciduous species present.

The gravelly east bank (Unit 1811) has characteristic shoreline vegetation with willow shrubs predominating, along with several species of sedges, grasses such as cut grass and reed canary grass, and a number of other herbaceous species with wet substrate affinities, including cat-tails, water smartweed, and beggarticks.

A mixed community reflecting the terraced landform and past land uses is enclosed by the bend of the river and the shoreline vegetation. Mosaics of very large cedars are here, especially in the western portion of the "peninsula", as are some open shrub areas, and some larger specimens of other tree species. The herbaceous flora here is diverse reflecting the diversity of habitats.

Floristic diversity in the R.O.W. is high, and there are several large (cm, dbh) tree specimens; e.g., sugar maple (80), white ash (110) in Unit 1813; red ash (77), sugar maple (77) in Unit 1812; and sugar maple (87) in Unit 1810. No Rare plants were found in the R.O.W., but four species have been reported from the general area (Gore and Storrie Ltd., 1992); these are:

- 1) muhly grass (var. filiformis) - rare in OMNR Central Region,
- 2) spreading sedge - rare in York/Metro,

- 3) avens (Geum laciniatum) - rare in York/Metro, and
- 4) red cedar - rare in York/Metro.

The general area is reported by Gore and Storrie Ltd. (1992) to be the "botanically richest area in Markham with 288 species of vascular plants."

No Significant forms of terrestrial vertebrate wildlife were observed, but one Provincially Significant bird species, Carolina wren, was reported at 500-1000 m north of the R.O.W., and twenty-seven species of breeding birds are present according to Gore and Storrie Ltd. (1992). A variety of birds were observed using the area; these include great blue heron, spotted sandpiper, and pileated woodpecker. Deer and deer sign were observed frequently. Evidence of recent beaver activity was present. The diversity of habitats, here, and in the entire river system suggests that a greater diversity of mammals may be found here than in most places in the larger local area. Although not observed, the Provincially Significant smokey shrew may be here as there is favourable habitat. Although only American toad was observed, it is expected that a range of common amphibians and reptiles may use the area.

The Rouge River system is an important corridor for both plant and animal dispersal.

The significance of this area of the Rouge River system is underscored by its designation as Locally Significant Area (L.S.A.) No. 9 - Rouge River Markham (Gore and Storrie Ltd., 1992).

Unit 1807 - Coniferous Woodland

Unit 1807 is a nearly pure white cedar grove between fairways on the IBM golf course. The R.O.W. encroaches on nearly all of this 0.3 ha woodland.

Herbaceous and shrub strata are virtually non-existent as is usually the case with a dense white cedar community.

No Rare vascular plant species or Significant terrestrial vertebrate wildlife was observed. White-tailed deer use this area of the golf course and common bird species may use this unit.

Unit 1806 - Coniferous Woodland

Unit 1806 is a nearly pure white cedar grove between fairways on the IBM golf course. The R.O.W. encroaches on 0.4 ha of this 1.6 ha woodland.

Herbaceous and shrub strata are virtually non-existent as is usually the case with a dense white cedar community.

No Rare vascular plant species or Significant terrestrial vertebrate wildlife was observed. White-tailed deer use this area of the golf course and common bird species may use this unit.

Unit 1805 - Shrubland

Unit 1805 is a somewhat artificial shrubland, in that it is composed of some remnant orchard trees and other planted species, between fairways of the IBM golf course. The R.O.W. encroaches on 2.0 ha of this unit.

A hedgerow along the east boundary is mostly hawthorn and apple. The shrubs and trees between fairways include Muhgo pine, Austrian pine, blue spruce (including some "green" blue spruces), and a number of apple trees. Some trees are natural remnants including white ash, white elm, and red oak. For all practical purposes, the herbaceous vegetation is manicured; this is the "rough" between fairways.

Because of its artificial nature and isolation from other natural units, this "shrubland" has virtually no corridor value.

No Rare plants or Significant wildlife were observed. Wildlife expected here are forms that do well (e.g., gray squirrel including the black phase) in a highly managed environment.

Unit 1801 - Old-field

Unit 1801 is rectangular in shape in the midst of active agricultural fields. The R.O.W. encroaches on 1.1 ha of Unit 1801.

The vegetation and wildlife habitat in this unit is typical of old-fields in the general area. Nothing of special significance has been identified.

Unit 1800 - Mixed Woodland

Unit 1800 is associated with the old-field of Unit 1801. The R.O.W. encroaches on the entire unit which is 0.5 ha in area.

This mixed woodland has resulted from expansion of several hedgerows in this area and still retains some hedgerow characteristics. Dominant tree species include Manitoba maple (75%), Norway spruce (10%), white pine (5%), Austrian pine (5%), and white cedar (5%). Shrubs include hawthorn, forsythia, and riverbank grape. Manitoba maple up to 15 m in height and 61 cm dbh were noted.

No Rare vascular plants or Significant forms of terrestrial vertebrate wildlife were observed. Raccoons may use this woodland, but nothing of special significance was observed.

Unit 1796 - Hedgerow

Unit 1796, a small native hardwood hedgerow extension of a 0.5 ha woodland unit north of the R.O.W. is encroached upon by the R.O.W. to the extent of 0.02 ha.

The woodland is dominated by basswood (40%), beech (15%), bur oak (15%), and sugar maple (15%) and hedgerow has similar composition.

Nothing of special significance has been identified, but rose-breasted grosbeaks were observed here.

This unit has no corridor value due to isolation.

Unit 1795 - Old-field

Unit 1795 is located on the northeast corner of the intersection of Ninth Line and the driveway into Unit 1793, an old residential site. The R.O.W. encroaches on 1.0 ha of this unit.

The vegetation and wildlife habitat in this unit is typical of old-fields in the general area. Nothing of special significance has been identified.

Unit 1793 - Old Residential and Farm Vegetation

Unit 1793 is a complex area of natural and planted vegetation associated with an old, but no longer existing, farmstead. The unit is on top of a ridge, with elements on the gentle slopes to both east and west. The R.O.W. encroaches on 0.9 ha of Unit 1793. The proposed centreline runs directly along the northern edge of the unit.

This unit is composed of the vegetation around the old homesite on the highest elevation and an adjacent apple orchard on the east slope. Also, a wide hedgerow-like area of vegetation, mostly Manitoba maple and red raspberry, extends to the south parallel to an old barn site.

The most abundant species in the upper tree canopy in the vicinity of the old residence and orchard are Norway spruce (40%), silver maple (30%), and sugar maple (10%). A wide variety of woody species is here, most of which were planted. The lower tree canopy, in addition to apple trees in the orchard, includes numerous white ash, black locust, and Norway maple. There are several sugar maples, many of which are senescent, along the north border of the unit, including the driveway to the west.

Woody species diversity is very high because of the wide variety of planted individuals, but there are no notably large individual specimens. The largest is a white willow at 66 cm dbh. Herbaceous species include planted types (e.g., lily-of-the-valley and orange day-lily) and invasive old-field and pioneer species. No Rare vascular plant species was found.

No Significant forms of terrestrial vertebrate wildlife were observed, and those expected to be in the unit are common species adapted to semi-disturbed habitats.

Corridor value of this unit is low-moderate, perhaps some local importance.

Unit 1792 - Wetland

Unit 1792 is a linear wetland attending a ditch between two agricultural fields. The R.O.W. encroaches on 0.3 ha of this unit.

Willow shrubs are dominant in this wetland and herbaceous plants are wetland species for the most part including cattails, bulrush, and reed-canary grass.

Corridor value is low as the north end is not connected to some other system.

No Rare vascular plants or Significant wildlife was observed.

Unit 1791 - Woodland/Shrubland

Unit 1791 surrounds old-field/shrubland Unit 1790, and with it attends a north-south drainage, as does the linear wetland Unit 1792. This community is essentially in two parts: one, along the east edge of Unit 1790, and, the second, south of Unit 1790 where it attends the drainage more directly. The R.O.W. encroaches on 0.2 ha of Unit 1791.

Willows and Manitoba maple up to 15 m in height dominate this unit.

Unit 1791 has some local corridor value, as it is part of a north-south intermittent drainage system.

No Rare plant or Significant terrestrial vertebrate wildlife were observed. White-tailed deer use the area, and in addition to resident species compatible with this and adjacent habitats, migratory birds use the area.

Unit 1790 - Old-field/shrubland

Unit 1790 is an area of old-field/shrubland attendant to an intermittent drainage in the southern portion of the R.O.W. The R.O.W. encroaches on 0.6 ha of this unit.

Herbaceous vegetation is typical of old-fields locally, and shrubs include willows, hawthorns, chokecherry and red raspberry. A single large (63 cm dbh) specimen of red ash is here, along with small numbers of Manitoba and silver maples.

Unit 1790 has some local corridor value, as it is part of a north-south intermittent drainage system.

No Rare plants or Significant terrestrial vertebrate wildlife species were observed. White-tailed deer use the area, and, in addition to common resident species compatible with this and adjacent habitats, migratory song-birds use the area.

Unit 1770 - Hedgerow

Unit 1770 is a "T-shaped" hedgerow with the upright (north-south) element of the T being perpendicular to, and south of, the R.O.W., which encroaches on 0.03 ha of this Unit.

This is a native hardwood hedgerow, with the north-south portion in a typical old-field matrix.

This unit has very little corridor function due to isolation and wide spacing between trees.

No Rare vascular plant species or Significant wildlife was observed or expected to be here.

Unit 1752 - Hedgerow

Unit 1752 is a north-south shrub hedgerow mostly in the southern portion of the R.O.W. The R.O.W. encroaches on 0.2 ha of this unit.

This unit has minimal corridor value due to discontinuities in the shrub vegetation.

No Rare vascular plant species or Significant wildlife was observed.

Unit 1751 - Shrubland

Unit 1751 includes a moist extension from a large woodland north but outside of the R.O.W., and the shrubland/old-field vegetation attendant to the north-south drainage, and to a tributary drainage from wetland Unit 1740, located to the east just north of the centreline. The R.O.W. encroaches on 3.0 ha of Unit 1751.

The area of this unit in the northern portion of the R.O.W. is dominated by small trees, especially white elm, many of which have succumbed to Dutch Elm Disease (DED), and white ash. Shrubs in this area and throughout the rest of the unit include willows, red-osier dogwood, hawthorn, buckthorn, red raspberry and poison ivy. Herbaceous species are typical of old-fields in the area with elecampane and jewelweed reflecting the somewhat moist soil conditions.

A variety of birds were observed, including red-tailed hawk and woodcock, and white-tailed deer use the area. No Rare vascular plants or Significant forms of terrestrial vertebrate wildlife were observed, but a range of species compatible with old-field/shrubland habitat can be expected here.

This unit has moderate local corridor importance as it provides habitat and connects the large woodland at the north with the rest of the drainage system to the south.

Unit 1740 - Wetland

Unit 1740 is a wetland in the north portion of the R.O.W., that drains to the south and west and is contiguous with an extension of Unit 1751. The R.O.W. encroaches on 0.4 ha of this wetland.

A shrub community attends this wetland area in the north. The shrub community contains at least six species of willows, Manitoba maple, and red-osier dogwood. Several sedges are here, as is common reed, common and narrow-leaved cattails, and black bulrush.

Corridor value is low because of relative isolation, but white-tailed deer use the area intensively.

No Rare vascular plants or Significant terrestrial vertebrate wildlife were observed.

Unit 1730 - Mixed Woodland/Drainage

Unit 1730 includes a small woodland and adjacent drainage. The R.O.W. encroaches on 0.4 ha of this system.

A triangular coppice-like ash woods and an adjacent drainage attended by willow shrubs compose this unit.

Corridor value is low due spatial isolation of this unit.

No Rare vascular plants or Significant wildlife was observed.

Unit 1715 - Hedgerow

Unit 1715 is a shrub hedgerow, with 0.1 ha encroached upon by the R.O.W.

Apple, hawthorn, and small white elm are scattered in a typical old-field matrix.

This unit has low corridor value, due in part to the discontinuities between shrubs.

No Rare vascular plants or Significant wildlife was observed or expected to be here.

Unit 1714 - Hedgerow

Unit 1714 is a double shrub hedgerow attending the CPR rail line. The R.O.W. encroaches on 0.6 ha of this unit.

This unit has low corridor value, due in part to the presence of the railway.

No Rare vascular plants or Significant wildlife was observed or expected to be here.

Units 1711 and 1712 - Little Rouge Creek Valley System (Woodland)

Units 1711 and 1712 are shown on Map 034. Unit 1712 comprises the steep bank on the west slope of the Little Rouge Creek system and a segment of flood plain in the northern part of the R.O.W. Unit 1711 is a more gently sloping area east of the creek, where, effectively, there is no flood plain. The R.O.W. is variously 60 - 300 m south of the CPR rail line in this area and encroaches on 2.7 ha of the total system; i.e., 1.8 ha in Unit 1711 and 0.9 ha in Unit 1712.

The west bank (Unit 1712) is dominated by a mixed coniferous-deciduous tree community with white ash and white cedar being dominant. A treed flood plain with mosaics of white cedar and deciduous species, respectively is at the base of this bank; other deciduous species include basswood, white elm, and balsam poplar. An area of open flood plain is immediately adjacent to the creek in the northern portion of the R.O.W., and is dominated mainly by reed canary grass associated with a mix of other herbaceous species such as spotted Joe-pye weed, tall goldenrod, woodland sunflower, smooth brome grass, and meadow fescue. Large crack willows are at the creek edge in some areas, and willow shrubs are found in some of the wetter areas in association with the open flood plain.

The east bank (Unit 1711) is occupied by a community of moderately mature white cedar with some occasional individuals of sugar maple, white ash, and ironwood, with a variety of deciduous shrubs and small trees on the western edge of this forest community.

Floristic diversity is moderately high in the R.O.W. due mainly to the presence of the four different habitats; i.e., east bank woodland, and on the west banks, open flood plain, treed flood

plain, and slope woodland. Notable tree specimens (cm dbh) were white cedar (62) and white ash (60) on the treed flood plain and west bank, respectively. No Rare plant species were observed. Gore and Storrie Ltd. (1992) did not report any rare species from the immediate vicinity of the study area, but they do make the point that the Little Rouge River South Area LSA is the largest continuous natural area in Markham, and is one of the botanically richest with 281 vascular plant species.

No Significant forms of terrestrial vertebrate wildlife were observed. Gore and Storrie Ltd. (1992) indicate that this valley system is the richest in Markham for birds with 50 breeding species, but they reported no Rare or Provincially Significant birds. A variety of birds were observed in this study including woodcock and ruffed grouse.

Deer sign were observed frequently, and the valley system provides important winter and corridor habitat. The diversity of habitats, here, and in the entire corridor suggests that a greater diversity of mammals may be found here than in most places in the larger local area. The Provincially Significant smokey shrew may be here as there is favourable habitat. Although only wood frog and American toad were observed it is expected that a range of common amphibians and reptiles use the area. Red-backed salamander was observed in the deciduous woodland north of the CPR rail line.

The Little Rouge Creek system is an important corridor for both plant and animal dispersal, as well as being especially important for deer.

The significance of this area of the Little Rouge Creek system is underscored by the designation as a Locally Significant Area (L.S.A.) No. 3A - Little Rouge River South (Gore and Storrie, 1992).

Unit 1697 - Old-field

Unit 1697 is a strip of old-field near the top of the east slope of Little Rouge Creek. This strip is located parallel to the creek and is adjacent to forest Unit 1711. The R.O.W. encroaches on 0.5 ha of this old-field.

This old-field is particularly lush and diverse with at least four species of asters and three species of goldenrods.

This unit has moderate corridor value by virtue of its proximity to the forest communities of the Little Rouge streams valley system.

No Rare vascular plants or Significant terrestrial vertebrate wildlife was observed.

6.2.2 Petticoat Creek Watershed

The length of the corridor in this watershed is 1.8 km. The R.O.W. encroaches on the following areas (ha) in each of the respective major habitat types: woodland (0.0), wetland (0.0), old-field (3.4), old-field/shrubland (0.0), shrubland (0.0), residential (0.0), hedgerow (0.26), and plantation (1.3). For the most part, residential vegetation was not evaluated, but in some places, where it was deemed sufficiently "natural" and otherwise relevant to the discussion, it was considered. In total, 10 terrestrial units are encroached on by the R.O.W. within the Petticoat Watershed (see Maps 034 and 071).

Units 1690 and 1691 - Hedgerows

These two hedgerows are natural hardwood hedgerows, comprising a hedgerow system, with some old-field herbaceous vegetation in corners formed by hedgerow segments. In total, the R.O.W. encroaches on 0.16 ha; i.e., 0.05 ha in Unit 1690 and 0.11 ha in Unit 1691.

The units may have some local corridor value, but they are relatively isolated.

No Rare vascular plants or Significant wildlife were observed or expected to be here.

Unit 1681 - Hedgerow

Unit 1681 is a natural hardwood hedgerow. The R.O.W. encroaches on 0.1 ha of this hedgerow.

There is a large ironwood (50 cm dbh) in the hedgerow.

This hedgerow has low corridor value due to discontinuities.

No Rare vascular plants or Significant wildlife were observed or expected to be here.

Unit 1680 - Plantation

Unit 1680 is a 1.8 ha conifer plantation, of which 1.3 ha is encroached upon by the R.O.W.

Most (over 55%) of the composition is white spruce with smaller percentages of red pine (15%), white pine (25%), European larch, and white cedar. As well, native deciduous species such as trembling aspen, sugar and Manitoba maples, and basswood have established in naturally, and in some cases individual trees remained from before establishment of the plantation. One of these is a large (75 cm dbh) bur oak located at the south edge. This approximately 35 year old plantation is robust with trees in good condition. The dominant conifers are up to 14 m in height and 28 cm dbh.

No Rare vascular plants or Significant terrestrial vertebrate wildlife was observed. As with most plantations, this is relatively poor wildlife habitat.

This unit has little corridor value, due to its relative isolation and low wildlife habitat value.

Unit 1671 - Old-field

Unit 1671 is an old-field. The R.O.W. encroaches on 3.4 ha of this unit.

Herbaceous vegetation is typical of old-fields in the general area.

No Rare vascular plants or Significant wildlife was observed or expected here.

Unit 1661 - Shrubland

Unit 1661 is a wedge-shaped area enclosed by 11th Line and Durham Road 30 just south of existing Highway 7. The R.O.W. encroaches on 2.8 ha of this unit.

Dominant shrubs and small trees include common buckthorn, Tartarian honeysuckle, red-osier dogwood, white cedar, basswood, Manitoba maple, and white ash. There are some scattered trees including a large (100 cm dbh) Manitoba maple, willow, white cedar, basswood, and Scots pine. Most of the woody vegetation is in the northern half of this unit, but there is a natural hardwood hedgerow along the eastern edge of the unit in the southern portion. The southern portion is vegetated mainly with typical old-field herbaceous species, and the scattered shrub and trees are in a matrix of old-field herbaceous vegetation.

The unit has low corridor value as it is not connected to other areas with substantial habitat.

No especially significant features were observed in Unit 1661.

Unit 1660 - Deciduous Woodland

Unit 1660 is a small (0.4 ha) woodland totally encroached upon by the R.O.W.

Tree species in this small unit include weeping willow, Manitoba maple, and basswood. A number of common shrubs and small trees are in this unit. Herbaceous vegetation is generally typical of old-fields and pioneer habitats.

This unit has virtually no corridor value due to its isolation.

No sensitive or significant features were observed or expected to be here.

Unit 1653 - Old-field

Unit 1653 is 1.3 ha old-field which is totally encroached upon by the R.O.W.

Herbaceous vegetation includes typical old-field grasses and forbs, and a number of shrubs and smaller trees are scattered throughout; these include red-osier dogwood, thickest creeper, apple, Manitoba maple, and some ironwood. A pond (Unit AA1655) is in the northern part of this unit, attended by weeping willows.

The presence of the pond confers some additional plant and wildlife habitat value to the unit, as well as increasing the otherwise modest corridor value.

No Rare vascular plant species or Significant forms of terrestrial vertebrate wildlife were observed.

Unit 1651 - Hedgerow

Unit 1651 is a natural hardwood hedgerow. The R.O.W. encroaches on 0.4 ha of this unit.

The dominant trees species are basswood, sugar maple, white ash, and ironwood. This is the only unit in the entire corridor in which black maple was noted.

Corridor value in this unit is low, but there is some connectivity with the pond in Unit 1653 to the northwest and the hedgerow complex to the southeast.

No Rare vascular plants or Significant wildlife was observed or expected here.

Unit 1650 - Hedgerow

Unit 1650 is a hedgerow complex including a double hedgerow attending a laneway (southward extension of Pickering Sideroad 34), and a hedgerow located at 90° to the double row and effectively a southeast extension of Unit 1651. All elements of this unit are native hardwood hedgerows. The R.O.W. encroaches on 0.5 ha of this unit.

White ash and sugar maple are the most abundant tree species. The shrub stratum is well developed and contains a number of common species. The herbaceous stratum comprises mostly old-field and pioneer species.

Corridor value is of some importance locally as these hedgerow elements have connectivity in all directions, including with the West Duffin Creek Valley System to the east.

No Rare vascular plant species or Significant vertebrate wildlife was observed or expected here, but this may be moderately important songbird nesting habitat.

6.2.3 Duffins Creek Watershed

The length of the corridor in this watershed is 11.1 km. The R.O.W. encroaches on the following areas (ha) in each of the respective major habitat types: woodland (35.1), wetland (11.9), old-field (13.4), old-field/shrubland (2.0), shrubland (2.9), hedgerow (4.1), and plantation (0.1). For the most part, residential vegetation was not evaluated, but in some places, where it was deemed sufficiently "natural" and otherwise relevant to the discussion, it was considered. In total, 49 terrestrial units are encroached on by the R.O.W. within the Duffins Creek Watershed (see Maps 071, 107, 147 and 177).

Unit 1645 - Hedgerow

Unit 1645 is a natural hardwood hedgerow. The R.O.W. encroaches on 0.1 ha of this hedgerow.

This unit has low corridor value because of large spaces between individual trees.

No Rare vascular plants or Significant wildlife was observed or expected to be here.

Units 1640 - 1642 - West Duffins Creek Valley System (Woodland/Old-field)

Units 1640 and 1641 are shown on Map 071. Unit 1641 is the moderately sloping west bank of West Duffins Creek. Unit 1640 is mixed woodland, meadow, and flood plain east of the creek, and numerous wet depressions and scattered drainages are in this unit. The study area includes a segment of the Seaton Trail and a manicured field where remote-controlled airplanes are flown. Unit 1640 is south and generally west of the air field. The R.O.W. encroaches on 3.6 ha of Unit 1640, 1.4 ha of Unit 1641 and 0.7 ha of Unit 1642.

The west bank (Unit 1641) is dominated by a mixed forest community of white cedar, hemlock, and deciduous species such as white ash, white elm, sugar maple, black cherry, and Manitoba maple.

Unit 1640, east of West Duffins Creek comprises mosaics of several different vegetation types. Mixed woods of relatively large specimens of white cedar, basswood, white elm, trembling aspen, balsam poplar, sugar maple, hemlock, white ash, and Manitoba maple dominate much of the unit. Herbaceous vegetation contains components of mature woodlands (e.g., crested fern and early meadow rue), successional and/or semi-disturbed sites (e.g., dog strangling vine and dame's rocket), along with a number of species with wetland affinities, including marsh marigold, touch-me-not, and ostrich fern. Large mosaics of garden burnet are found in the wet woodland, and much common comfrey is in the flood plain near the creek. Yellow lady slipper also was observed in this unit. An old-field system (Unit 1642) with typical vegetation is located centrally. Mosaics of the woodland and typical flood plain vegetation are spatially mixed near the east bank of the creek. A number of large crack willows are here as is a notable sugar maple (100 cm dbh). Reed canary grass is abundant near the east bank and several species of willows, both shrubs and trees, are scattered throughout and along the shoreline.

Unit 1642 is a typical old-field system that projects south into Unit 1640. Asters and golden-rods are abundant here.

Floristic diversity is generally high in the R.O.W. reflecting the presence of a number of different habitats in this system. No Rare plant species were observed, but Cases' ladies'-tresses (Rare in York/Metro, but not so in Durham) was observed south of the R.O.W. by MTRCA (1982) in Whitevale Corridor ESA which extends to the southern edge of the R.O.W. MTRCA (1982) reports 181 vascular plant species, including black walnut, a Carolinian species, but not Rare.

No Significant forms of terrestrial vertebrate wildlife were observed or reported. MTRCA (1992) indicates that 36 bird species were observed including ruffed grouse.

Deer sign were observed frequently and the valley system provides important winter and corridor habitat for deer. Beaver activity was observed and signs of raccoons activity are abundant. No amphibians or reptiles were observed, but it is expected that a range of common species would use the area.

The West Duffins Creek system is an important corridor for both plant and animal dispersal. The forest communities, especially south of the study area comprise some tracts of mature sugar

maple and hemlock forests, respectively, as well as extensive well-developed white cedar communities.

Unit 1622 - Shrubland

Unit 1622 is a young conifer plantation with seedlings planted in rows in an old-field matrix. The R.O.W. encroaches on 2.0 ha of this unit.

The unit has virtually no corridor value because there is little habitat. Meadow voles and their predators are likely here, as are some common birds such as song sparrow.

No Rare plants or Significant wildlife was observed or expected here.

Unit 1620 - Old-field

Unit 1620 is an old-field. The R.O.W. encroaches on 4.7 ha of this unit.

Herbaceous vegetation is typical of old-fields in the general area. There are occasional small wet areas with cattails and willows, and an occasional tree such as hawthorn, apple or white elm.

This unit has very little corridor value due to lack of tree and shrub cover.

No Rare vascular plants or Significant wildlife was observed or expected here.

Unit 1615 - Hedgerow

Unit 1615 is a natural hardwood hedgerow. The R.O.W. encroaches on 0.3 ha of this hedgerow, which is a southward extension of woodland Unit 1600.

This unit has some corridor value as it is connected to larger woodland blocks at both ends.

No Rare vascular plants or Significant wildlife was observed or expected here.

Unit 1600 - Mixed Woodland

Unit 1600 is a block of mixed woodland along approximately 400 m of the northern portion of the R.O.W; it also has a southward hedgerow extension. The woodlot within the R.O.W. is on the bank of a drainage system to the north; the entire system is parallel to the R.O.W. The R.O.W. encroaches on 1.1 ha of this unit.

This relatively open woods in the R.O.W. is dominated by sugar maple, beech, white ash and white pine. Manitoba maple and black cherry are here as well. The larger ash are in the 65-70 cm dbh range, beech are up to 60 cm dbh, and sugar maple are up to 80 cm dbh. Most of the sugar maple are in the west portion and the east portion is composed mainly of apple trees. The southward extension is contains mainly of moderately sized Manitoba maple and white ash.

The combination of hedgerow, woods, and woodland edges provides excellent habitat for songbirds.

The unit is mainly of local importance as a corridor.

No Rare plant or Significant wildlife species were observed.

Unit 1590 - Hedgerow

Unit 1590 is a wide natural hardwood hedgerow. The R.O.W. encroaches on 0.3 ha of this hedgerow.

This unit may have some corridor value as it is part of a long hedgerow system, but with no connectivity in the vicinity of the R.O.W.

No Rare vascular plants or Significant wildlife was observed or expected here.

Unit 1550 - Mature Upland Deciduous Forest

Unit 1550 is an 0.8 ha mature upland forest which is totally encroached upon by the R.O.W.

Sugar maple (95%) dominates this community, with a mixture of other upland hardwoods composing the remaining 5%. The shrub stratum is mostly sugar maple and white ash regeneration with a mixture of common shrubs (e.g., chokecherry, riverbank grape) at the edges of the woodland. Herbaceous species are those normally found in mature woods.

Individual maple trees are up to 65 cm dbh and up to over 20 m in height.

A small hedgerow extends southward from the southwest corner of this rectangular unit. A variety of shrubs and small trees compose the hedgerow, including hawthorns, willows, white spruce, white ash, and trembling aspen.

No Rare plant species or Significant wildlife forms were noted, but deer use this woodland heavily in summer. Corridor value is low due to the spatial isolation of this unit.

Unit 1545 - Hedgerow

Unit 1545 is a natural hardwood hedgerow. The R.O.W. encroaches on 0.1 ha of this hedgerow.

This unit has low corridor value due to its sparseness and isolation.

No Rare vascular plants or Significant wildlife was observed or expected here.

Unit 1530 - Wetland

Unit 1530 is a 5.5 ha wetland unit that is totally within the R.O.W. This wetland has been neither evaluated nor classified by OMNR.

The central portion of this wetland is dominated by common cattail which mixes with reed-canary grass toward the periphery. The peripheral areas are dominated by reed-canary grass.

There are several widely scattered shrub and small trees. The trees include silver maple, Manitoba maple, and white elm and are located mainly in the east end. Shrubs include at least four species of willow and red-osier dogwood. There are some small areas of open water in the centre of the wetland.

No Rare vascular plants were found. Also no wildlife activity was observed other than red-winged blackbirds, but this is valuable wetland habitat and a range of vertebrate forms including several amphibian species can be expected to use the area.

Corridor value is limited as there is no connected wetland habitat to the west, but outlet drainage to the east provides some corridor in that direction.

Unit 1525 - Old-field

Unit 1525 is wet old-field associated peripherally with wetland Unit 1530. The R.O.W. encroaches on 2.8 ha of this unit.

Reed-canary grass dominates and defines this wet field area which, as indicated, surrounds the cattail wetland (Unit 1530) and extends north and west of lowland forest Unit 1520.

While corridor value for this unit, per se, is not high, this wet old-field area is an important adjunct to wetland Unit 1530.

No Rare vascular plants or Significant wildlife was observed.

Unit 1520 - Lowland Deciduous Woodland

Unit 1520 is a triangular unit abutting the north border of wetland Unit 1530. There is some hedgerow extension from this unit to the north, west, and east, but for all practical purposes the unit is totally encroached upon (1.4 ha) by the R.O.W.

Large (up to 60 cm dbh and 20 m in height) Manitoba maple dominate (90%) of this lowland woods. Other tree species in less abundance include basswood and white elm. Both the shrub

and herbaceous strata are moderately diverse and they (e.g., jewelweed) reflect the moist substrate conditions.

No Rare vascular plant species or Significant wildlife was found, but several birds were observed including northern oriole and red-eyed vireo.

While corridor value, per se, is not high this small woodland is an important adjunct to wetland Unit 1530.

Unit 1508 - Hedgerow

Unit 1508 is a shrub hedgerow. The R.O.W. encroaches on 0.1 ha of this hedgerow.

This unit has low corridor value, because of relative isolation.

No Rare vascular plants or Significant wildlife was observed or expected here.

Unit 1506 - Hedgerow

Unit 1506 is a natural hardwood hedgerow. The R.O.W. encroaches on 0.2 ha of this hedgerow.

This unit has moderate corridor value as it is wide and extends considerable distance to the south into a 9 ha upland deciduous woods.

No Rare vascular plants or Significant wildlife was observed or expected here.

Unit 1502 - Hedgerow

Unit 1502 is a natural hardwood hedgerow that attends the drainage from wetland Unit 1530. The R.O.W. encroaches on 0.1 ha of this hedgerow.

This unit has some corridor value as it connects the large wetland in the west to forest and shrubland elements in the east.

No Rare vascular plants or Significant wildlife was observed or expected here.

Unit 1501 - Deciduous Woodland

Unit 1501 is a mixed-age woodland that attends a drainage at this location. The R.O.W. encroaches on 0.3 ha of this system.

Red ash (90%) is dominant with lesser amounts of Manitoba maple, white ash and white elm. Shrub and herbaceous strata are composed of common forms which reflect both moist substrate and successional conditions.

The unit has moderate corridor value in that it connects wetland and forest elements both upstream and downstream.

No Rare vascular plants or Significant forms of wildlife were observed. Birds noted include northern oriole, woodcock, Canada goose, yellow warbler and yellow throat.

Unit 1500 - Deciduous Woodland

Unit 1500 is a small (0.1) woodland 120 m west of the Pickering Rod and Gun Club. The R.O.W. encroaches on all ha of this unit.

This small woodland block is around an old homestead area and is composed mostly of Manitoba maple with white ash and apple present. Shrub and herbaceous strata contain common species generally characteristic of somewhat disturbed areas.

Corridor value of this unit is minimal and local.

No Rare vascular plants or Significant forms of wildlife were observed. Deer use the area.

Unit 1490 - Hedgerow

Unit 1490 is a natural hardwood hedgerow which is on each side and within the south extension of Sideline 22. Also, there is an east-west element to the east, abutting wetland Unit 1484. The R.O.W. encroaches on 0.3 ha of this hedgerow.

This unit has some corridor value as it connects Unit 1484 at the north and a hedgerow complex to the south.

No Rare vascular plants or Significant wildlife was observed or expected here.

Unit 1485 - Old-field/Shrubland

Unit 1485 is an old-field/shrubland. The R.O.W. encroaches on 1.4 ha of this unit.

Scattered shrub and herbaceous vegetation is typical of old-field/shrubland in the general area.

This is part of a complex which forms a wildlife corridor east and west in association with woodland and shrubland Units 1480 - 1483. Also, there is a juxtapositional relationship with wetland Unit 1484 and a woodland block south of the R.O.W.

Unit 1484 - Gravel Quarry Wetland

Unit 1484 is an old gravel quarry, which is now a 4.3 ha wetland system, 3.2 ha of which is encroached upon by the R.O.W. (Map 107). This wetland has been neither evaluated nor classified by the Ontario Ministry of Natural Resources (OMNR).

Approximately 15-20% of the wetland, depending on the season, is occupied by a small pond. Most of the dominant vegetation is composed of small trees and shrubs of successional species including trembling aspen, balsam poplar, Manitoba maple, white elm, willows, red-osier dogwood, and common buckthorn. Wetland and moist substrate plant species are generally common. It is notable that there are at least ten species of willows (*Salix*) in this system.

No Rare vascular plants were observed in the study area.

No Significant forms of terrestrial vertebrate wildlife were observed, but several species of herpetofauna breed here. Those observed breeding were American toad, green frog, wood frog, and spring peeper, and snapping turtles were observed laying eggs in the east bank near the pond. Birds observed are common species. Evidence of the presence of beaver, deer and raccoon were observed, and a range of other common mammalian species can be expected.

This wetland resource is locally important, especially for reptilian and amphibian reproduction. Its importance is further enhanced by its direct connection to forest and shrubland systems to the south and east, respectively.

Unit 1483 - Mixed Woodland

Unit 1483 is mixed forest of which 2.1 ha is encroached upon by the R.O.W.

Much of the southern half of this area is covered by white cedar. In the north portion of the unit, the woody vegetation is less well developed with white cedar establishing in an old-field setting. Deciduous elements are important as well, especially in the southwest corner of the unit where there are some large sugar maple (approx. 110 cm dbh; 20 m high). Herbaceous and shrub strata are composed of common woodland and old-field species.

This area is part of an east-west corridor associated with Units 1480 - 1482, and 1485, as well as being part of a woodland corridor south of wetland Unit 1494.

No Rare vascular plants or Significant wildlife was observed but this area along with other units mentioned above forms an important wildlife habitat complex.

Unit 1482 - Mixed Woodland/Drainage

Unit 1482 is a woodland which attends a drainage along its eastern border. The R.O.W. encroaches on 1.5 ha of this unit.

Black ash, crack-willow, Manitoba maple, white cedar, and white elm (many having succumbed to DED) are here in the wetter areas. Shrub and herbaceous strata overall are diverse.

This area is part of an east-west corridor associated with Units 1480, 1481, 1483 and 1485. In this general area, however, the corridor is oriented more to the southeast, following the drainage.

No Rare vascular plants or Significant wildlife forms were recorded, but this entire area is important wildlife habitat. Deer and ruffed grouse were observed.

Unit 1481 - Coniferous Woodland

Unit 1841 is a large block of white cedar forest, only 0.7 ha of which is encroached upon by the R.O.W. The larger portion block is south of Units 1480, 1482, 1483, and 1485, and not in the R.O.W.

White cedar is dominant. Shrub and herbaceous strata are composed of common woodland and woodland edge species.

This unit is part of an east-west corridor, which in this area becomes oriented more to the southeast following the drainage in this location.

No Rare vascular plants or Significant wildlife was observed but this entire area is important wildlife habitat.

Unit 1480 - Shrubland/Woodland

Unit 148 is a diverse area immediately west of Sideline 22 and adjacent to 1481 and 1482. The R.O.W. encroaches on 2.1 ha of this unit.

A grove of medium-sized black locust is adjacent to Sideline 22, to the west of which are small cattail wetlands, in a matrix of old-field and shrubland. Butternut is scattered in this area. Willow, red-osier dogwood, white cedar characterize the shrubland, further west. Tall crack

willow are in wetter places in the southern part of the unit. Herbaceous and shrub strata generally reflect both wetland and old-field conditions.

This unit is part of a complex to both the west and south that is important wildlife corridor.

No Rare vascular plants were noted, but yellow lady slipper is in this unit. No Significant wildlife was noted, but deer, ruffed grouse, and ovenbird were observed.

Unit 1450 - Urfe Creek Valley System (Woodland/Floodplain)

Unit 1450 is a stream valley system with moderately steep slopes. The R.O.W. crosses the system where the system is least wide, encroaching on 0.8 ha.

Mixed forest covers the valley slopes with dominants being white ash (20%), and with crack willow, sugar maple, red oak, and white pine estimated at 15% each. Basswood, black cherry, white and yellow birches, and beech are among those species comprising the remaining 20%. The canopy height is over 20 m.

White cedar, especially on the west bank, white elm, ironwood and blue beech are in the lower tree canopy.

Large crack willow are in the flood plain, much of which has old-field herbaceous cover.

There are a number of large old trees here with the largest being a twin-stemmed red oak, each stem of which is approximately 100 cm dbh. Tall (22 m high) white pine are also in this system. A sugar maple beech community is in the southern portion of the right-of-way.

Floristic diversity is high, but no Rare plant species were found. Deer sign are here, but no other wildlife was observed.

The stream in this valley is rather small and slow-flowing. The system is probably an important deer corridor, but not a deer-wintering area. Otherwise corridor value is expected to be low, because of the proximity to the northern terminus.

No Rare vascular plants or Significant wildlife was observed, but certainly the range of wildlife that uses this corridor is greater than that in the surrounding agricultural lands.

Unit 1440 - Hedgerow

Unit 1440 is a natural hardwood hedgerow. The R.O.W. encroaches on 0.2 ha of this hedgerow.

This unit has virtually no corridor value as it is relatively isolated and trees are widely spaced.

No Rare vascular plants or Significant wildlife was observed or expected here.

Unit 1430 - Hedgerow

Unit 1430 is a natural hardwood hedgerow. The R.O.W. encroaches on 0.2 ha of this hedgerow.

This unit has virtually no corridor value as these are relatively widely spaced roadside trees.

No Rare vascular plants or Significant wildlife was observed or expected here.

Unit 1410 - Brougham Creek Valley System (Woodland)

Unit 1410 is a stream valley system with moderately sloping banks in the area of the R.O.W. The R.O.W. encroaches on 2.3 ha of this unit.

The mixed forest in this stream valley is dominated by white ash (30%) and trembling aspen (30%), the remainder including white pine (10%), ironwood (15%), and sugar maple (10%). A large sugar maple (106 cm dbh) is here. The shrub and herbaceous strata are diverse, containing a mixture of woodland and old-field species. Much of the area in the northern portion of the R.O.W. is quite open with old-field grasses dominating.

Floristic diversity is high, but no Rare plant species were observed. No significant wildlife was observed but the habitat suggests that a full range of vertebrates common to the area would be found here.

Corridor value is expected to be moderate.

Unit 1390 - Spring Creek Valley System (Old-field/Shrubland)

Unit 1390 is an open old-field/shrubland area in the Spring Creek Valley system. The R.O.W. encroaches on 1.5 ha of Unit 1390.

Mosaics and widely spaced individuals of white elm, common buckthorn, apple and others are found here the midst of typical old-field herbaceous vegetation. Most trees and shrubs are located on the valley banks.

The unit may have some minor local importance as a corridor.

No Rare vascular plants or Significant wildlife was observed here.

Unit 1391 - Hedgerow

Unit 1391 is a natural hardwood hedgerow. The R.O.W. encroaches on 0.1 ha of this hedgerow.

This unit has very little corridor value.

No Rare vascular or Significant wildlife was observed or expected here.

Unit 1385 - Hedgerow

Unit 1385 is a natural hardwood hedgerow. The R.O.W. encroaches on 0.2 ha of this hedgerow.

This unit has minimal corridor value as trees are somewhat widely spaced, and the north end is not connected to another system.

No Rare vascular or Significant wildlife was observed or expected here.

Unit 1370 - Mixed Forest

Unit 1370 is mixed forest attendant to a small coldwater stream. The western portion of this system slopes very gently toward the stream, with a similarly flat east bank near the stream. Various, up to 50 m east from the stream a bank rises very steeply. The R.O.W. encroaches on 2.5 ha of this system.

A major discharge area is within the woodland, just southeast of the Highway 7 and Sideline 16 intersection.

This forest block is dominated by white cedar (at least 70%) with a mixture of other common species including trembling aspen, white birch, white ash, white elm, yellow birch and hemlock, all in relatively small amounts.

Floristic diversity is quite high (one of the most diverse areas along the entire study corridor). At least 13 tree species, 23 species in the shrub stratum, and at least 50 herbaceous species were noted in the relatively small area. No Rare vascular plants were observed, however.

No Significant wildlife was observed, but a range of types for which this is good habitat are expected here.

The area is part of a major corridor southeast to the main Duffins Creek system, but the corridor value of this unit is diminished by the presence of Highway 7 immediately north, and by considerable alteration of natural features immediately north of Highway 7.

Unit 1360 - Mixed Woodland

Unit 1360 is now a 1.6 ha remnant of a formerly 5 ha (MNR-FRI, 1978) forest block. The R.O.W. encroaches on 0.6 ha of this remnant.

This woodland is dominated more or less equally (40% each) by white cedar and white pine. White ash, sugar maple, and hemlock are here as well. Most of the shrub stratum is occupied by willows which have established in the areas where trees were removed.

The unit has virtually no corridor valley due to its isolation.

No Rare vascular plants or Significant wildlife was observed.

NOTE TO THE READER

The preceding material covers the study area for Highway 407/Transitway from Markham Road to Highway 7 east of Brock Road. The discussion of terrestrial units east of the study limits of this undertaking have not been included here.

6.3 Summary of Environmentally Significant Issues

In ascribing significance/sensitivity values to terrestrial units, or logical groups of units, it is assumed that the proposed corridor passes over the surface of the land from Whitby/Oshawa Boundary to Highway 48, i.e., from Unit 845 through Unit 1814. No assumptions have been made regarding the type of drainage crossing (e.g., bridge), route realignment, or mitigative procedures that might be invoked.

Significance/sensitivity scores have been ascribed to each unit, or group of units where applicable. See Table 6.3.1 for assignation of scores and results.

Units of primary significance/sensitivity are those with scores of 12-17. Units of secondary significance are with scores of 10-11. Major streams valley systems, with one exception, are all areas of primary or secondary significance. The exception is the Lynde Creek system where vegetative cover is relatively sparse, and where significant human disturbance has occurred.

Units with scores of 4-9 are of intermediate to low significance and include less well developed drainage systems, and areas of small size or generally lesser importance. Scores of 0-3 are mostly hedgerows and old-fields.

The units (areas) of primary significance are:

- Units 1220-1275 (17 points) - Duffin Creek Valley System, with high plant diversity, important wildlife habitat, nearby ESAs, high corridor value, mature lowland forest, and high potential for Rare and/or Significant species.
- Units 1810-1813 (15 points) - Rouge River Valley System, part of an LSA, with high plant diversity, important wildlife habitat, high corridor value, and Rare or Significant species.
- Units 1640-1642 (15 points) - West Duffins Creek Valley System is near an ESA and rare species site, has significant plant

community assemblages, high corridor value, and high plant diversity.

- Unit 1484 (15 points) - Wetland Unit 1484 is a heterogeneous wetland in an abandoned gravel quarry. Amphibian and reptile presence was the greatest observed anywhere in the entire study corridor. Also, this is considered of part of an important wildlife complex along with Units 1480-85.
- Units 1711-1712 (12 points) - Little Rouge Creek Valley System, part of an LSA, is the largest continuous natural area in Markham, has high plant diversity, important bird habitat, and has high corridor value and high potential for Rare and Significant species.

The units (areas) of secondary significance are:

- Units 1000-1002 (10 points) - West Lynde Creek Valley System is part of an ESA, has high-moderate corridor value, is CLOCA (1978) significant forest and significant wildlife habitat, and has upland deciduous forest on the east bank with some large tree specimens.
- Unit 1200 (10 points) - Woodland Unit 1200 is a 120-year old 8.0 ha deciduous forest. This is an outstanding example of this forest type, which once covered much of southern Ontario. Very little (0.6 ha) of this unit is in the R.O.W., but the entire woodland would be downwind of automotive emissions, were the proposed centreline to remain in its present position.

The frequency of units with respect to significance/sensitivity scores (e.g., 39 units had a score of 1) is presented in Table 6.3.2.

TABLE 6.3.2
SIGNIFICANCE/SENSITIVITY SCORES

Score	Frequency (Number of units, or unit groups) ¹
0	62
1	39
2	6
3	4
4	0
5	3
6	0
7	2
8	3
9	2
10	2
11	0
12	1
13	0
14	0
15	3
16	0
17	1
18	0
SUM = 128	

¹ E.g., Units 1810-1813, for these purposes, count as a single entity.

TABLE 6.3.1
SIGNIFICANCE/SENSITIVITY MATRIX

(west)

Legend:

Characteristics		Points
1.	ESA/LSA in or near R.O.W.	3
2.	Corridor Value High (H) Medium (M) Low (L)	3 1 0
3.	Presence of Rare plants	1 per species
4.	Significant Wildlife Species	3
5.	On Oak Ridges Moraine (ORM)	1
6.	MNR ORM Mature Woodland	1
7.	CLOCA (1978) Significant Forest	1
8.	CLOCA (1978) Significant Wildlife Habitat/Area	1
9.	Geomatics (1994) on ORM - 730 ha forest	1)
10.	- core area	1) max. 1 point
11.	- natural corridor	1)
12.	Significant Plant/Wildlife Habitat Assemblage	3
13.	Wetland Presence in or near R.O.W. - OMNR classified, or otherwise significant wetland - other wetland	3 1
14.	Upland Mature Forest	1
15.	Presence of large trees	1

Scores for ESA/LSA, corridor, and Geomatics presented in summary columns.

"Other" = Professional judgement additional scoring, with explanatory "comment" column.

Total = Total Significance/Sensitivity Score.

TABLE 6.3.1
SIGNIFICANCE/SENSITIVITY MATRIX
WEST

[illegible]

TABLE 6.3.1
SIGNIFICANCE/SENSITIVITY MATRIX
WEST

[illegible]



Expansion of
Unit Identifier:

eg. TA234
AL357
T A L
Terrestrial or
Aquatic Feature Type
Area or
Linear Feature Type
Unit Number
1234
1357

TERRESTRIAL BIOLOGY

Shrubland
Wetland
Woodland
Hedge Row
Old Field
Plantation
Residential Vegetation

Aquatic Biology Study Area
Watershed Boundary
Watercourses (from MTO base data)
Woodlands (from MTO base data)

BASE INFORMATION
Match Line
Centreline of Technically Preferred Route
Highway 407/Transit Transportation Corridor/
Terrestrial Biology Study Area

TERRESTRIAL MAP:

000

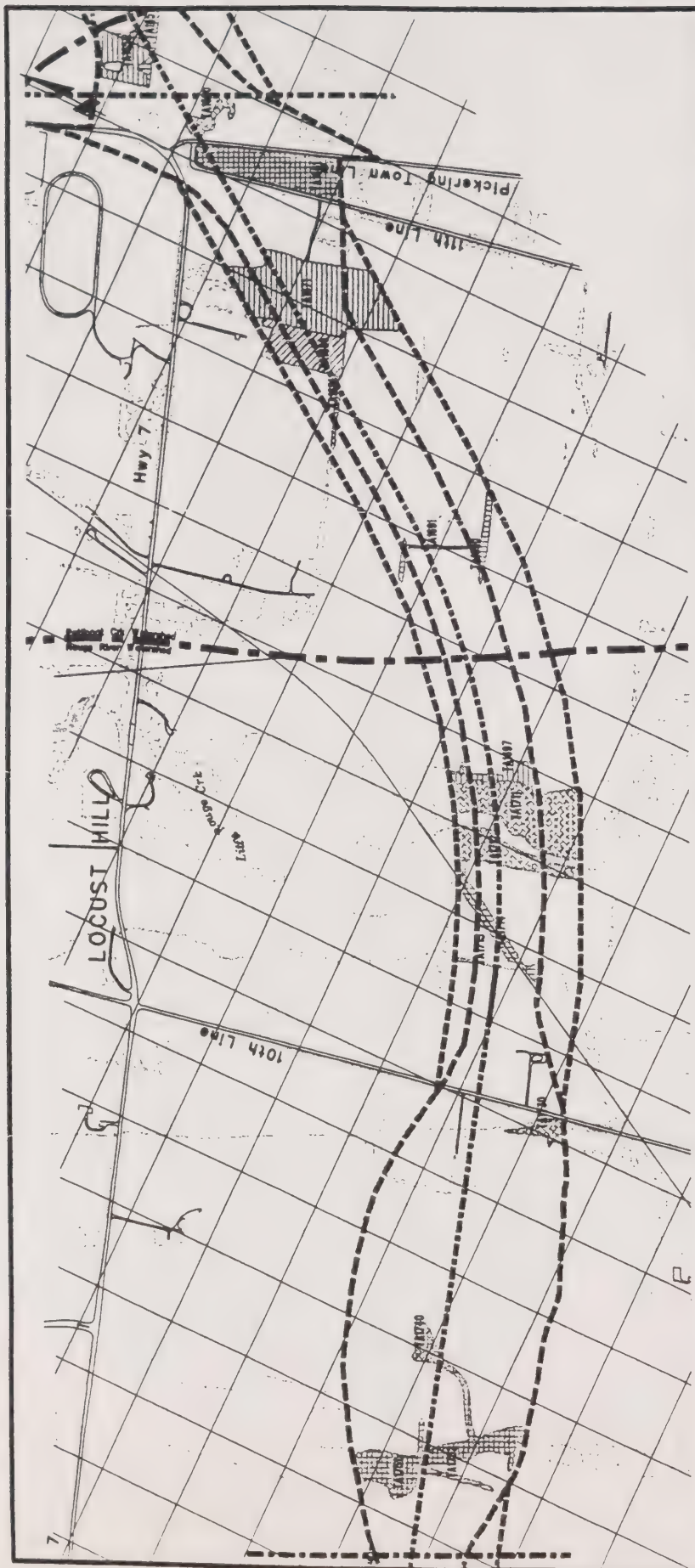
JUNE 1995

Detailed Aquatic and Terrestrial
Biological Study -
Highway 407/Transit Transportation
Corridor Technically Preferred Route
Highway 48 - Whitby/Oshawa Boundary



Fenco MacLaren





BASE INFORMATION

- Watch Line
- Centreline of Technically Preferred Route
- Highway 407/Transit Transportation Corridor/ Terrestrial Biology Study Area

- Aquatic Biology Study Area
- Watershed Boundary
- Watercourses (from MTO base data)
- Woodlands (from MTO base data)

TERRESTRIAL BIOLOGY

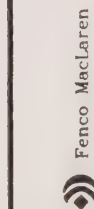
- Hedge Row
- Old Field
- Plantation
- Residential Vegetation

- Shrubland
- Wetland
- Woodland

Explanation of Unit Identifier:

eg. TA1234
AL1357

T Terrestrial or
A Aquatic Feature Type
L Area or
Linear Feature Type
1234 Unit Number
1357



Fenco MacLaren

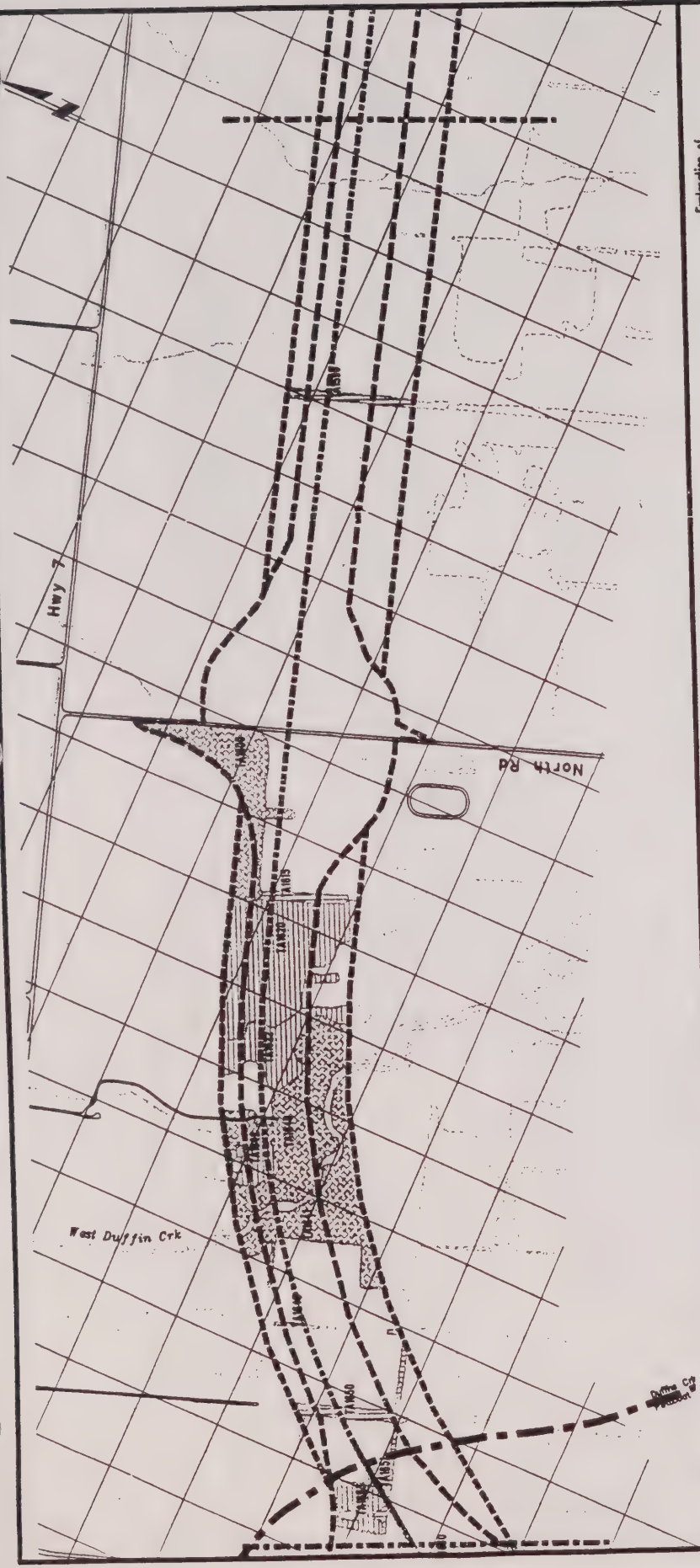


Detailed Aquatic and Terrestrial
Biological Study -
Highway 407/Transit Transportation
Corridor Technically Preferred Route
Highway 48 - Whitby/Oshawa Boundary

TERRESTRIAL MAP:

034

JUNE 1995



BASE INFORMATION

- Match Line
- Centreline of Technically Preferred Route
- Highway 407/Transit Transportation Corridor/
- Terrestrial Biology Study Area

TERRESTRIAL BIOLOGY

- Aquatic Biology Study Area
- Watershed Boundary
- Watercourses (from MTO base data)
- Woodlands (from MTO base data)
- Hedge Row
- Old Field
- Plantation
- Residential Vegetation

Explanation of Unit Identifier:

09. T1234
AL1357

T A L
Terrestrial or
Aquatic Feature Type
Area or
Linear Feature Type
Unit Number
1234
1357

TERRESTRIAL MAP:

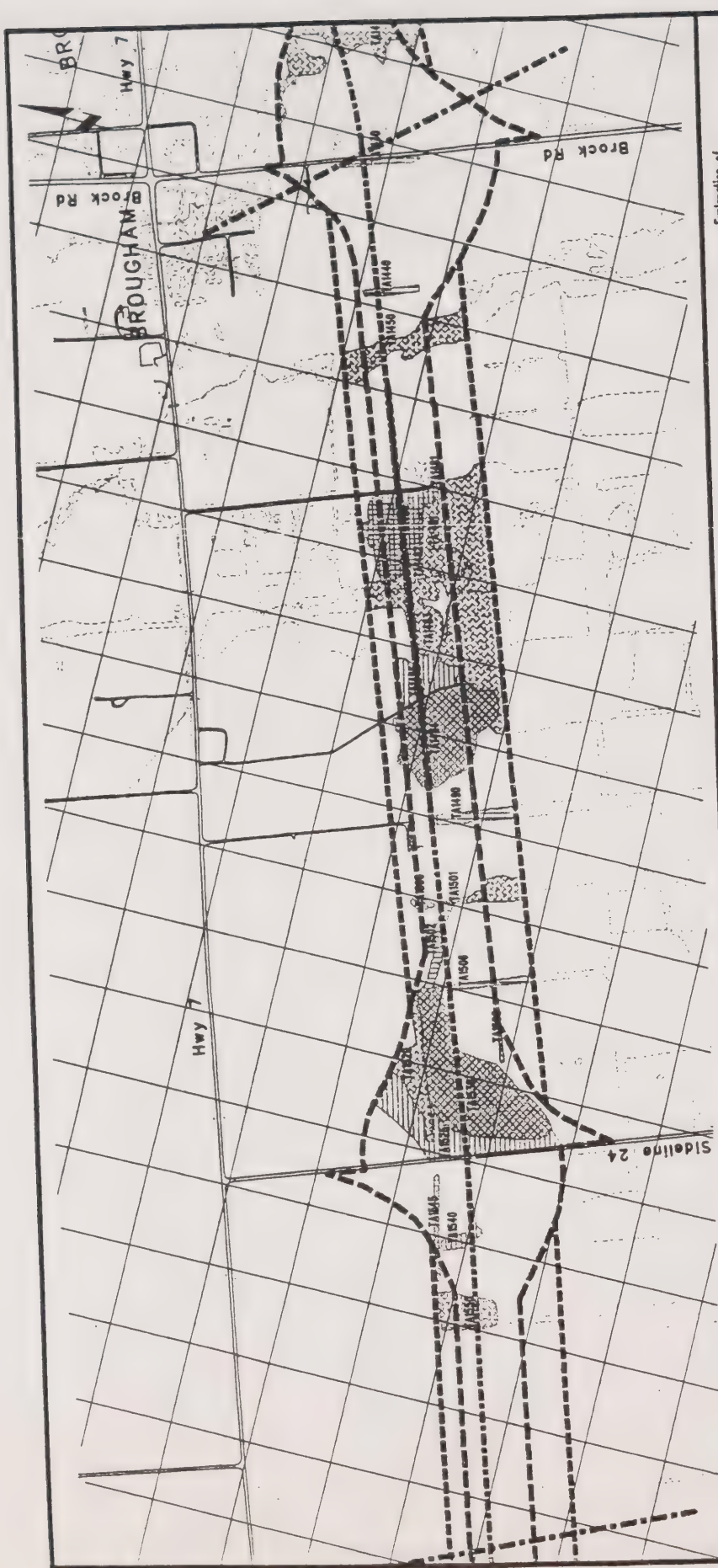
071

JUNE 1995

Detailed Aquatic and Terrestrial
Biological Study -
Highway 407/Transit Transportation
Corridor Technically Preferred Route
Highway 48 - Whitby/Oshawa Boundary

0 km 1 km 2 km 3 km 4 km 5 km 6 km 7 km 8 km

Fenco MacLaren



BASE INFORMATION

- Match Line
- Centraline of Technically Preferred Route
- Highway 407/Transit Transportation Corridor
- Terrestrial Biology Study Area

TERRESTRIAL BIOLOGY

- Aquatic Biology Study Area
- Watershed Boundary
- Watercourses (from MTO base data)
- Woodlands (from MTO base data)
- Hedge Row
- Old Field
- Plantation
- Residential Vegetation

Explanation of Unit Identifier:

- T1434
- A1357
- T1440
- A1450
- T1450
- A1501
- T1504
- A1504
- T1504
- A1504
- T1504
- A1504

- Terrestrial or Aquatic Feature Type
- Area or Linear Feature Type
- Unit Number

TERRESTRIAL MAP:

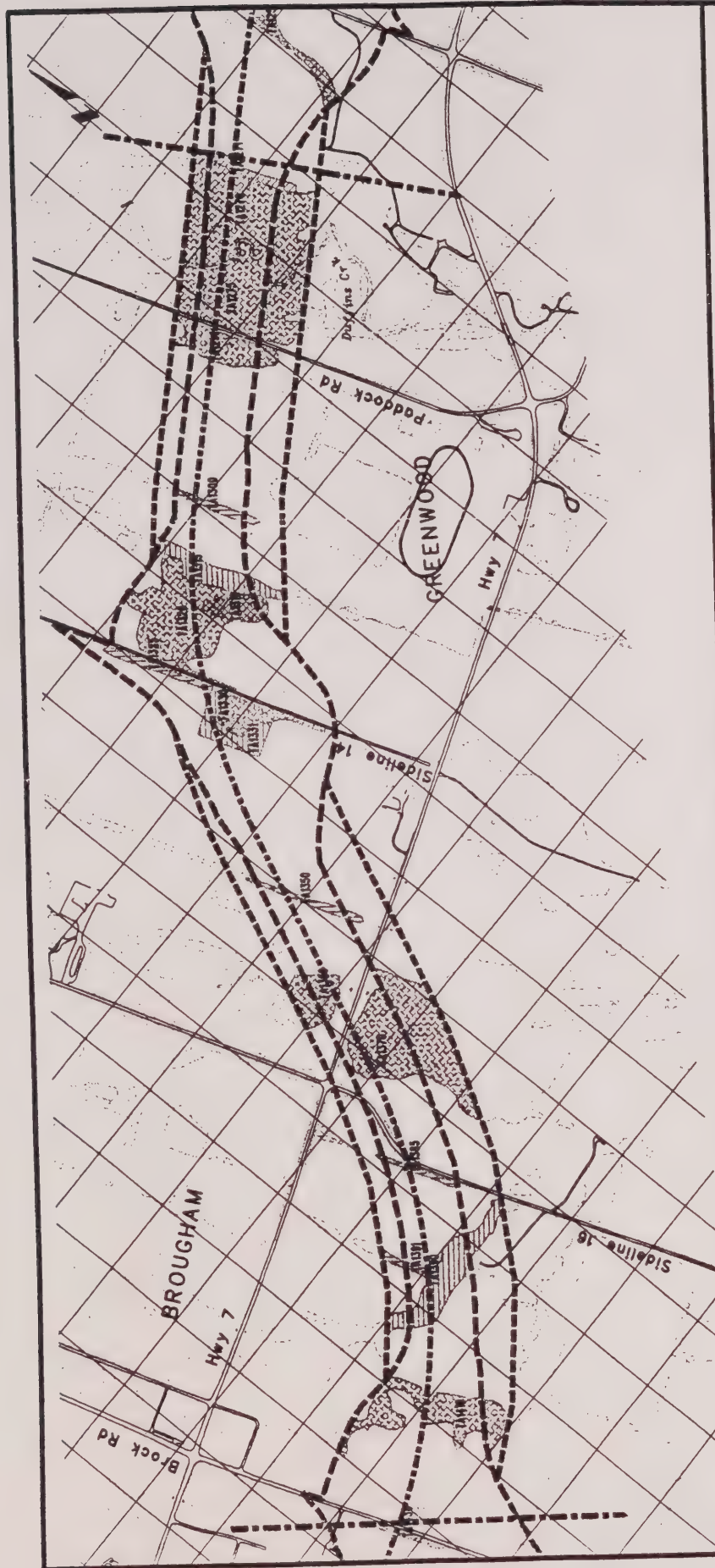
107

JUNE 1993

Detailed Aquatic and Terrestrial Biological Study - Highway 407/Transit Transportation Corridor Technically Preferred Route Highway 48 - Whitby/Oshawa Boundary



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Explanation of Unit Identifier:

eg.
TA1234
AL1357

T	Terrestrial or
A	Aquatic Feature Type
	Area or
L	Linear Feature Type
	Unit Number
	1234
	1357

TERRESTRIAL BIOLOGY

	Hedge Row	Old Field	Plantation	Residential
1	1	1	1	1
2	1	1	1	1
3	1	1	1	1
4	1	1	1	1
5	1	1	1	1
6	1	1	1	1
7	1	1	1	1
8	1	1	1	1
9	1	1	1	1
10	1	1	1	1
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86	1	1	1	1
87	1	1	1	1
88	1	1	1	1
89	1	1	1	1
90	1	1	1	1
91	1	1	1	1
92	1	1	1	1
93	1	1	1	1
94	1	1	1	1

Shrubland	Wetland	Woodland
		

Aquatic Biology Study Area
Watershed Boundary
Watercourses (from WTD base)
Woodlands (from WTD base)

BASE INFORMATION

Match Line
Centreline of Technically Preferred Route
Highway 407/Transit Transportation Corridor/
Terrestrial Biology Study Area

**Detailed Aquatic and Terrestrial
Biological Study -
Highway 407/Transit
Corridor Technically Preferred Route
Highway 48 - Whitby/Oshawa Boundary**

TERRESTRIAL MAP:

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NAME _____



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APPENDIX 21
STAKEHOLDER CONSULTATION PROCESS

STAKEHOLDER CONSULTATION PROCESS

HIGHWAY 407/TRANSITWAY

MARKHAM ROAD EASTERLY TO HIGHWAY 7
EAST OF BROCK ROAD

Ministry of Transportation

February 1997

STAKEHOLDER CONSULTATION PROCESS HIGHWAY 407/TRANSITWAY - MARKHAM ROAD EASTERLY TO HIGHWAY 7 EAST OF BROCK ROAD

INTRODUCTION

During the Route Planning Study for Highway 407 from Markham Road to Highway 35/115, there was extensive involvement of the external agencies and interest groups. This involvement contributed to the selection of a technically preferred route.

The Ministry is preparing for the design and construction of the Highway 407 partial extension employing a process similar to that used for the delivery of Highway 407 west of Markham Road.

The Ministry recognizes the sensitivities associated with the crossing of the major and minor watercourses in the study area, and is committed to the involvement of affected stakeholders in the design process to ensure that the Highway is designed and constructed in a way that is responsive to these stakeholders' interests.

Since the design has not commenced details about the crossings have not yet been determined. This provides ample opportunity for stakeholder input to the design.

The following sets out the proposed design process.

THE TECHNICAL ADVISORY CONTACTS

To ensure that the design process proceeds efficiently while ensuring that it is responsive to the goals of the affected agencies the Ministry will require that the Highway 407/Transitway design team meet with the affected agencies and municipalities. A representative from each of the affected agencies/municipalities who can make decisions on behalf of their organization will be consulted. The purpose of this consultation is to provide a forum through which environmentally related design, construction, maintenance and operation issues can be identified, discussed and resolved on an ongoing basis throughout the design and construction phase. Experience shows that this is a highly efficient and effective mechanism for ensuring that agency interests are properly addressed in the design and construction of the facility. In addition, these agencies have the mandated goals of environmental protection, thus ensuring that these goals are properly accounted for during the design. It will also ensure that new information collected through other studies is considered in the decision-making process.

Attendance at these meetings will change depending upon the issues being addressed. However, because of the number of areas of interest to MNR and MTRC, these agencies will be involved in most meetings. They will also be copied on minutes of other relevant meetings.

STAKEHOLDER CONSULTATION PROCESS

When addressing relevant issues within the Rouge Watershed, a representative of the Rouge Park Alliance will be invited to the meetings. Similarly, when addressing fishery compensation issues or navigation issues the Department of Fisheries and Oceans will be invited, and when addressing issues relating to the railway crossing, a representative of the Canadian Transportation Agency will be invited. All agencies will be able to become involved when their mandated areas of interest are affected.

The design team will meet with the technical advisory contacts on a regular basis during the design phase. Meetings may be held on-site as necessary to facilitate discussions. In addition, the technical advisory group will be consulted during the construction phase as issues arise that need discussion and resolution. A schedule of meetings will be established at the outset of consultation to ensure that stakeholders can effectively schedule their participation, and all meetings will be documented.

THE EXTERNAL GROUP

The external group consists of the technical agencies having expressed an interest in ongoing involvement with the Highway 407/Transitway project. They have been involved throughout the planning of this project and will continue to be kept informed of the progress of the design and construction phases through correspondence and meetings as issues that are relevant to specific agency mandated concerns arise. Specific contact will be made near the beginning and towards the end of the design phase. Additional contacts will be made as required to resolve any issues.

MUNICIPAL INVOLVEMENT

Throughout the planning of this undertaking municipal staff and elected officials have been involved. During the design and construction phases municipal staff will be consulted on an ongoing basis as issues arise. In addition, as necessary, presentations will be made to municipal councils.

PUBLIC CONSULTATION

The public has been kept informed of the progress of the Highway 407 studies and influenced the planning of the undertaking. In order to keep the public informed through the design phase and to allow for public input, two public consultation sessions will be held during the design phase.

STAKEHOLDER CONSULTATION PROCESS

In addition, public notification of the commencement of construction will be provided.

THE DESIGN PROCESS

The design is usually carried out in two phases - preliminary design and detailed design. These two phases have traditionally followed one after the other. Because of the intention to accelerate the design and construction of the Highway 407/Transitway project, the preliminary design and detailed design phases may be combined as an evolving process. It is likely that components of the undertaking will be at different stages in the design and construction process. Since construction may occur over several years, design of the portion of the undertaking that will be constructed in a subsequent year may be done while previous portions are being constructed.

Environmental Protection Objectives

Although the specific objectives for protecting the environment will be determined during the design phase in consultation with external agencies and municipalities, Attachment "A" sets out objectives that address issues that have been identified thus far during the consultation process for this project. These have been developed in consultation with affected agencies.

Design Alternatives Stage

Early in the design phase, the design concepts are developed - addressing issues such as general arrangement, structure types, spans, clearances, pier placement, site access, vertical and horizontal grades, interchange placement and configuration, and preliminary stormwater management plans. In addition, during this phase property acquisition and archaeological and built heritage mitigation activities will be started, and geotechnical surveys will be carried out.

At the start of the design of each watercourse crossing, meetings will be held to discuss each agencies' objectives with respect to the crossings. To facilitate these discussions, the Table provided in Attachment "B" will be completed for each crossing. This step is critical to ensuring that the design team and stakeholders have a common understanding of the issues, constraints and goals to be addressed by the design. The information to be considered includes: stream habitat classification and type at the crossing locations; MNR habitat sensitivity level for fish at the crossing; system sensitivity downstream of the crossing location; stormwater management sensitivities at the crossing (including storage and passage of flood flows, water quality and erosion control); other

STAKEHOLDER CONSULTATION PROCESS

environmental conditions (e.g. terrestrial habitat and corridors, groundwater conditions, public access, and ESA features and functions); and engineering design constraints.

Alternative design concepts will be developed and evaluated on the basis of issues including environmental impacts, ability to mitigate environmental effects, transportation objectives, engineering requirements, constructability, and cost. A preferred design concept will be developed/refined in consultation with the stakeholders.

During this phase, initial mitigating measures and fishery habitat compensation plans (where required), will be developed in consultation with stakeholders. As well, the need for, and nature of follow-up monitoring will be determined in consultation with MNR, MTRC, MOEE, RPA, DFO and DOE. Again, ongoing consultation will ensure that, as the details of the design are refined, agency concerns continue to be addressed.

DOCUMENTATION OF THE DESIGN PHASE

When the design of a component of the undertaking has been completed, the specific commitments to environmental protection measures, ongoing consultation and follow-up monitoring will be documented in a "Design and Construction Report" and made available to the stakeholders for review and comment prior to the commencement of construction.

CONSTRUCTION PHASE

Prior to construction, construction plans will be prepared to ensure that construction is carried out in accordance with the agreements reached during the design phase. This includes the implementation of environmental protection measures, restoration and/or compensation plans. Copies of construction plans will be made available to stakeholders for review and comment prior to commencement of construction.

ENVIRONMENTAL ASSESSMENT ACT APPROVALS

This undertaking must receive approval under both Ontario's Environmental Assessment Act (EAA) and the Canadian Environmental Assessment Act (CEAA). These are discussed below.

Ontario's Environmental Assessment Act

The Ministry of Transportation will be submitting an One-Stage Environmental Assessment to the Ministry of Environment and Energy for approval under the

STAKEHOLDER CONSULTATION PROCESS

Environmental Assessment Act. After an environmental assessment document has been prepared in consultation with affected agencies and the public, an application will be made to the Ministry of Environment and Energy (MOEE) for Environmental Assessment Act approval to designate the right of way; acquire property; and construct, operate and maintain the undertaking. Following receipt of the environmental document, the MOEE will conduct a review of the document in consultation with affected agencies. The MOEE will also provide a period for public review. Although the ongoing consultation process is intended to ensure that all issues are identified and addressed to the satisfaction of stakeholders, there will be details that will be addressed during the design phase following EA Act approval. This Stakeholder Consultation Process will be included in the EA to ensure that stakeholder involvement is sustained throughout the design phase.

The Canadian Environmental Assessment Act

The Canadian Environmental Assessment Act (CEAA) requires that a CEAA approval be obtained for those projects requiring federal lands, federal funding, or specified federal approvals. The Highway 407 project is expected to trigger CEAA because of three types of federal approvals. The review carried out under CEAA will be a Screening of the environmental affects, including cumulative effects, associated with the specific activities that trigger the Act.

During the design phase application will be made for federal approvals under the Navigable Waters Protection Act (NWPA) for the Rouge River Crossing, and potentially the Canadian Transportation Act (CTA) for the crossing of CPR's Havelock Subdivision. Where required, these applications will be accompanied by suitable environmental and design reports that provide the necessary environmental information to conduct a screening under the Canadian Environmental Assessment Act (CEAA). In addition, where it is determined by the MNR that harmful alteration of fish habitat will occur, authorization under the Federal Fisheries Act will be required. Issuance of this authorization also triggers CEAA. The potential Federal Approvals are described in more detail in Attachment "C".

OBJECTIVES FOR ADDRESSING ENVIRONMENTAL ISSUES

1.0 INTRODUCTION

The following sets out objectives for the design and construction phases of Highway 407/Transitway from Markham Road to the planned terminus point to address the key environmental concerns raised during the study. When reading these objectives, the following short forms apply.

DFO - Department of Fisheries and Oceans
CCG - Canadian Coast Guard (part of DFO)
F&HM - Fisheries and Habitat Management (part of DFO)
DOE - Department of the Environment
CTA - Canadian Transportation Agency
MTO - Ministry of Transportation of Ontario
MOEE - Ministry of Environment and Energy (Ontario)
MNR - Ministry of Natural Resources (Ontario)
MCzCR - Ministry of Citizenship, Culture and Recreation.
MTRC - Metropolitan Toronto Region Conservation Authority
RPA - Rouge Park Alliance
CPR - Canadian Pacific Railway
NWPA - Navigable Waters Protection Act
CEAA - Canadian Environmental Assessment Act

1.1 PROPOSED OBJECTIVES

1.1.1 Aquatic Resources

The undertaking crosses 3 main watercourses (Rouge River, Little Rouge Creek, West Duffins Creek), and numerous smaller tributaries. The following sets out the objectives that will guide the design phase in order to deal with the concerns raised during this study.

Watercourse Crossings

As a result of this more detailed field work, the Ministry has committed to providing bridges at 6 key crossings. Bridges are proposed at the Rouge River, the Little Rouge Creek, the West Duffins Creek, an unnamed tributary of the West Duffins Creek (Lot 3 Concession 5), Ufré Creek and an unnamed tributary of the Duffins Creek located east of Brougham (NE part of Lot 16, Concession 5) if a new crossing is required. In addition, bridges will be considered for

other crossing locations where warranted to minimize aquatic and terrestrial impacts. The following objectives apply wherever water crossings occur:

- Consult with MNR, MOEE, MTRC, and DFO during design.
- When designing and constructing facilities in the vicinity of lakes and watercourses, the proponent will have regard to the provisions of the Lakes and Rivers Improvement Act, and O.Reg 158/90 under the Conservation Authorities Act.
- Design crossings so as not to impede fish movement.
- Design the Rouge River structure to avoid interfering with navigation.
- Avoid the placement of piers within the watercourse channel under bankfull flow conditions.
- Minimize the placement of fill and abutments within the regulatory flood plain, and/or the meanderbelt or 100 year erosion limit of watercourses.
- Where practical, orient bridge piers in the direction of flow so as to maximize hydraulic efficiency during flood conditions.
- Where possible, design bridges to minimize/avoid alteration to the watercourse.
- Develop and implement erosion control plans before, during and after construction.
- Develop access roads for bridge construction and maintenance to minimize disruption to the natural systems and slope stability. Restore access roads that are not required for future structure maintenance. Stabilize access roads that will be required for future maintenance.
- Design crossings with consideration for wildlife and human passage.
- Conduct ongoing consultation with affected agencies during the design and construction phases.
- Where site conditions permit, maintain or re-establish riparian vegetation on

both sides of watercourses.

- Conduct a drainage analysis and design the structures so as to minimize erosion and flood risk upstream and downstream of the structure.
- Where feasible, closed-bottomed culverts will not be used in upwelling areas.
- Time any necessary in-stream construction to avoid critical fish migration and spawning periods, or construct in the dry. Any temporary realignments of watercourses to permit construction in the dry will be designed in consultations with MNR, MTRC, RPA and DFO.
- In those situations where MNR determines that there will be harmful alteration of fish habitat, submit an Application for the Authorization for the Alteration of Fish Habitat (with supporting plans) to DFO. Develop the compensation plan and Application for Authorization in consultation with MNR, MTRC, RPA and DFO.

Groundwater

Concern has been expressed over the potential effects of the undertaking on groundwater resources and wells. To address these concerns, the following objectives apply:

- At the design stage, contact will be made with external stakeholders to update information on groundwater resources.
- The designers and the contractor will be responsible for addressing quantity or quality impacts to shallow groundwater resulting from the construction of the undertaking.
- Where dewatering operations are required, applicable Water Taking Permits and Certificates of Approval will be obtained.
- Any wells or septic systems removed from service as part of the undertaking will be properly abandoned/decommissioned.

Stormwater Management

The following objectives apply to this undertaking.

- During the design phase, prepare a Stormwater Management Plan, dealing with both water quantity and quality, in accordance with MTO guidelines in consultation with MOEE, MNR, MTRC, DFO, DOE and the RPA.
- The proponent will strive to design stormwater management ponds to detain the minimum of a 2 hour 25mm storm event for 24 hours to address water quality and erosion concerns. Where agencies demonstrate a need, other detention times or additional quantity sizing requirements will be considered during the design phase in consultation with stakeholders.
- When designing BMPs, consideration will be given to measures for reducing adverse environmental impacts to surface and groundwater, including those related to temperature and salt.
- Bridge runoff should be discharged to stormwater management facilities (preferably a pond or swale) prior to discharge to watercourses where this reasonably can be achieved and will not cause unacceptable environmental, highway design, safety or operational problems.
- Where feasible, opportunities for providing ease of containment of accidental spills will be provided during the design of stormwater management facilities.

Erosion and Sedimentation

Control of erosion and sedimentation during and after construction is important to protecting terrestrial and aquatic resources. The following objectives are to minimize erosion and control sedimentation:

- During the design phase, conduct an analysis of the erosion implications, and develop appropriate temporary and permanent erosion control strategies.
- Consider the potential for destabilizing of banks due to groundwater and soils conditions, during the design phase, and develop/implement mitigating strategies where required.

- Develop erosion control plans prior to construction. Erosion control techniques should include such measures as silt barriers, sediment ponds, flow check dams, natural buffers and sediment traps. Erosion control measures will be maintained until erodible areas have been stabilized.
- Bench slopes as necessary to reduce sheet erosion where such practices are deemed to be beneficial and will not cause additional unacceptable disturbance to vegetation, other natural areas or top of slope.

1.1.2 Terrestrial Resources

Vegetation

There are numerous woodlots along the proposed route of the undertaking. The route has been selected to minimize impacts on these woodlots and further reduction in impacts can likely be achieved during the design phase. However, vegetative impacts will occur. The following objectives are intended to minimize these impacts.

- Where warranted, vegetation removals will be managed in consultation with MNR, MTRC and RPA.
- During construction, protect vegetation that does not have to be removed.
- The proponent will utilize or provide reasonable opportunities for property owners and interest groups to salvage/transplant vegetation and seed sources.

Wildlife and Corridors

Within the study area, the more significant wildlife habitat is associated with the major river valleys. Intrusion into these areas can adversely affect wildlife habitat and corridors. The following objectives are proposed to minimize wildlife impacts.

- Where possible, develop planting programs in consultation with MNR, MTRC, RPA and DOE to encourage habitat/corridor functions at watercourse crossings. Use native species where practical.
- When necessary, time tree removal to avoid significant nesting of migratory birds.

- Where practical and feasible, fill, top-dress and seed rip rap that could be hazardous to larger mammals.

1.1.3 Noise

At the design stage, site specific noise mitigating measures will be developed in consultation with the MOEE. Accordingly, the following objectives will apply:

- Identify noise and vibration sensitive areas.
- Establish operational noise impacts and, if sound levels exceed the applicable limits, develop and implement appropriate noise mitigating measures in consultation with MOEE and in accordance with the MTO/MOEE Noise Protocol.
- Identify and consider applicable municipal noise control by-laws. Where timing constraints, or any other municipal by-law may cause hardship to the proponent, an exemption from this requirement should be sought directly from the municipality in question.
- Minimize construction noise by ensuring that noise control devices on construction equipment are properly maintained.

1.1.4 Heritage Resources

During the Route Planning Phase, archaeological sites and historical buildings were identified. In addition, there is the potential that undiscovered archaeological sites exist within the proposed right of way of the technically preferred route. To ensure that heritage resources are identified and protected, the following is proposed:

- Field investigations are now underway to identify the specific nature and extent of archaeological resources impacted by the highway, and to develop appropriate mitigating measures. This is being done in accordance with the MTO/MCzCR Protocol for Dealing with Archaeological Concerns on Ministry of Transportation Undertakings. Any necessary salvage work will be carried out prior to construction.
- The mitigation of impacts to all historical buildings adversely affected by this undertaking will be developed in consultation with MCzCR and the local

heritage planners. The assessment work is currently underway, and any necessary mitigating measures will be implemented prior to construction.

1.1.5 Spills

Concerns were raised about the environmental implications of on-highway spills. Under Ontario's Environmental Protection Act, the remediation of on-highway spills is the responsibility of the owner of the spilled pollutant or the person having control of the pollutant at the time of the spill. Therefore, the proponent will be responsible for the remediation of any spills resulting from its operations. As well, where feasible, opportunities for providing ease of containment of accidental spills will be provided for as part of the design of stormwater management facilities.

1.1.6 Landfills and Soil Contamination

The undertaking does not cross any known areas where waste materials have been landfilled. The undertaking does however, cross the north-western most corner of the Brock North Landfill property located on Part Lot 16, Concession 5 in the Town of Pickering. Although the entire site was certified for use as a landfill, only that portion of the site located approximately .5 to 1 kilometre to the south of the proposed Highway 407/Transitway right-of-way was actually used for waste disposal. The owner of the site is currently removing the waste material to another licensed landfill with the concurrence of the MOEE. The proponent is contacting the MOEE to confirm whether or not any approvals under the Environmental Protection Act (EPA) will be necessary.

Preliminary site screening of accessible property was conducted, and, because the lands required for the undertaking are primarily in agricultural usage, significant waste deposition or soil contamination was not identified and is not suspected. However, it is possible that landfilled waste or other contamination may be discovered during subsequent phases including property acquisition. Any waste materials or contaminated soils encountered will be managed in accordance with the requirements of applicable legislation, such as the EPA, and applicable guidelines such as the MOEE Guidelines for Use at Contaminated Sites in Ontario.

1.1.7 Follow-up

Follow-up activities may be required to ensure that environmental protection measures that have been committed to, are properly implemented during construction. To this end, the following objectives apply:

- Develop construction/contract measures to ensure compliance with environmental protection commitments, and ensure that clear responsibility for environmental inspection is assigned.
- Hold ongoing discussions with the contractors to address issues.
- Undertake audits to ensure that contract provisions are followed and that corrective actions are undertaken if necessary.
- During the design phase and as part of the Stakeholder Consultation Process, determine the need for post-construction monitoring (e.g. stormwater, fisheries) in consultation with MNR, MOEE, MTRC, RPA DOE and DFO. If a monitoring plan is needed, a plan will be prepared and implemented as appropriate.

FEDERAL APPROVALS

There is the potential requirement for 3 types of federal authorizations for this undertaking. These authorizations can only be obtained after receiving CEAA approval. The authorizations relate to the Rouge River Crossing, the crossing of the CPR railway line, and any stream crossing requiring an authorization for harmful alteration of fish habitat. The following summarizes the federal approvals for Highway 407 east of Markham Road.

The Crossing of the CPR Line

A crossing of the CPR Havelock Subdivision will be required. This rail line has 1 track diagonally crossing the corridor in the vicinity of Locust Hill in Lot 8, Concession 10 in the Regional Municipality of York (4859600N, 644350E). The crossing location is surrounded by agricultural land. There is a shrub hedgerow on both sides of the rail line. These hedgerows have little corridor value and no rare vascular plants or significant wildlife were observed or expected in this area. To the west of the railway is an agricultural swale with a shrub hedgerow consisting of apple, hawthorn and small white elm scattered in a typical old-field matrix. This unit has low corridor value and no rare vascular plants or significant wildlife were observed or are expected. To the east is the Little Rouge Creek. For the purposes of the Canadian Transportation Act approval, the structure that is required to cross the Little Rouge Creek is separate from the railway crossing, and will not be part of the Canadian Transportation Agency (CTA) approval.

Where an agreement can be reached with the CPR, no approval decision by the CTA is required, and therefore there is no CEAA trigger. If however, an agreement cannot be reached, a decision will be required from the Canadian Transportation Agency. The requirement for this authorization triggers a CEAA Screening. Because the CEAA Screening cannot be done until a request for An Order to Construct is made, and because the request for the Order must contain design information, the actual CEAA screening must wait until the design information can be provided. The CTA can do a screening and issue a preliminary Order to Construct on the condition that more detailed design information is provided for their approval before construction begins. Therefore, a design and construction report may need to accompany the application for An Order to Construct, addressing the specific environmental assessment requirements as specified in the CTA's Environmental Assessment Guide.

The Crossing of the Rouge River - NWPA

The Canadian Coast Guard has determined that the Rouge River is the only navigable

waterway affected by the undertaking. This crossing will require an authorization under the Navigable Waters Protection Act. This authorization is a trigger under CEAA and therefore a CEAA Screening will be required. The Canadian Coast Guard will be the Lead Responsible Authority for this screening. At the time of application for a NWPA approval, design and environmental impact and mitigation information will be provided so that both a CEAA Screening and the issuance of the NWPA Approval can be done.

Department of Fisheries and Oceans

Under the Fisheries Protocol signed between the MTO and the MNR, the first point of contact to address fisheries issues is with the MNR. It is only in those situations where MNR concludes that harmful alteration of fish habitat will occur, that an authorization from the Department of Fisheries and Oceans (DFO) is required. Upon referral of a water crossing project to DFO for Authorization under the Fisheries Act, DFO will determine if an Authorization may be issued on the basis of the information provided and the mitigation and compensation measures proposed. Once a decision to issue an Authorization is made, the requirement for a CEAA screening is triggered. A detailed assessment of the stream crossings will be carried out during the design phase of the study. This analysis will be presented in a supplemental report that will be submitted with a joint proponent/MNR letter of intent, to DFO in support of the request for Authorization and the CEAA Screening. This report will be prepared in consultation with MNR, MTRC, DFO and DOE and will address the detailed impact and mitigation measures, including any required mitigation and fisheries compensation.

APPENDIX 22
NOISE IMPACT ASSESSMENT METHODOLOGY

APPENDIX 23
TRAFFIC TECHNICAL REPORT

**Highway Noise Impact Assessment Methodology
For
Highway 407
From Markham Road Easterly to Highway 7
East of Brock Road**

February 10, 1997

**Chris T. Blaney
Senior Environmental Planner -
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Ministry of Transportation, Ontario
Central Region
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1.0 STUDY PURPOSE

At the design stage, the Proponent will carry out a noise impact assessment for the proposed Highway 407 construction. The projects limits are from Markham Road easterly to Highway 7, east of Brock Road. The acoustical modelling assessment conducted for this project will determine the potential noise impacts that the proposed highway has on adjacent noise sensitive areas (NSA's). The modelling will also be used to predict future impacts following the completion of the ultimate cross section of the facility.

Several individuals residing in residential areas near the highway corridor have raised concerns about potential noise level increases resulting from the undertaking. The Proponent will examine the issue of noise mitigation following the methodology outlined in Section 3. A report will be prepared documenting the information from the study.

2.0 BACKGROUND

2.1 Highway Traffic Volumes

The detailed acoustical modelling analysis will use the latest available road traffic volume information. The road traffic volumes and the percentage of commercial vehicles will be documented in the noise report.

The traffic volumes for all of the roadways and highways within the project limits along with the associated truck percentages will be determined. The Proponent will use the higher of Average Annual Daily Traffic or Summer Average Daily Traffic.

2.2 Highway Noise Prediction Model and Method

The highway noise prediction model that will be used is the United States Federal Highway Administration Method and the STAMINA 2.0 highway noise prediction model or a subsequent model jointly approved by the Ministry of Transportation and the Ministry of Environment and Energy (MOEE).

Included in the modelling will be:

- the posted speeds for the roadways in the area used in the noise analysis, and
 - the pavement surface recommended for construction of the highway, and
 - the elevations, contours and location of all of the NSA's near the right-of-way, and
 - the use of the proposed construction staging and the ultimate proposed facility.
-

3.0 NOISE IMPACT ASSESSMENT

3.1 Noise Policy and Protocols and Manuals

Unless otherwise noted in this report, the following documents will apply when undertaking the noise analysis;

"A Protocol for Dealing with Noise Concerns During the Preparation, Review and Evaluation of Provincial Highways' Environmental Assessments", February 1986

Quality and Standards Division Directive QST A-1, *"Noise Policy and Acoustic Standards for Provincial Highways"*, March 1, 1992

Ministry of Transportation, *"Environmental Office Manual, Technical Areas - Noise"*, May 15, 1992

Application of modifications to the above documents will be done only with the agreement of the Ministry of Environment and Energy.

3.2 Noise Study Area

Under the provisions of the MTO/MOEE Noise Protocol, areas that may require noise analysis, because of the Highway 407 construction, will be determined based the smallest of the areas defined by the following methods:

- i) using five decibel contour lines extending from the source to a NSA where there is no increase above the ambient sound level at the time of design; or
- ii) the distance to a NSA where there is no increase above the ambient sound level at the time of design; or
- iii) a perpendicular distance of 600 metres from the closest edge of pavement,

based on a detail design level of terrain information with the ultimate plan.

3.4 Noise Study Methodology

The proponent will carry out a noise evaluation for the following highway conditions:

- i. existing noise conditions at the time of design, and
- ii. with Highway 407, based on 2011 a land use scenario, and
- iii. assuming no Highway 407, based on a 2011 land use scenario.

In addition, if the Proponent proposes to initially build less than the ultimate undertaking, a noise evaluation for this condition will be carried out and documented.

The proponent will carry out a noise evaluation and prepare a report documenting sound levels and impacts for any expansions of the highway and will provide mitigation when the conditions in section 3.5 occur.

3.5 Noise Mitigation Requirements

The feasibility of noise mitigation on the Highway 407 right-of-way will be investigated if there is a significant increase in the noise levels. Based on existing and approved residential development at the time of EA approval, mitigation will be provided under the following conditions when the noise level increases meet the following criteria:

- A. when the cumulative impact of the facility is greater than a 5 dBA increase in sound levels above the future no Highway 407 scenario, as determined at the time of design for initial construction,
- AND
- B. noise mitigation must achieve a minimum reduction of 5 dBA, averaged over the first row of homes,
- AND
- C. the mitigation must be cost effective. (MTO currently spends an average of \$35,000 per home, in 1996 dollars)

The mitigation, when it is applied, will be designed for the ultimate highway. Noise mitigation measures will be applied at the time of initial construction when warranted and

feasible based on the above conditions. If projected impacts are associated with the future expansion of the approved facility, during detail design, the Proponent will protect for those future noise mitigation requirements.

Noise mitigation options include the use of noise walls, berms, vertical and horizontal alignment shifts, road cuts and the use of quieter highway pavement surfaces.

3.6 Noise Impact Documentation

Following the opening of any section of the highway, a table as follows will be included in the report documenting noise levels and proposed mitigation measures. (Table 1)

(Sample) Table 1 - Individual Sound Levels Listed by Receiver

	A	B	C	D	E	F	G
Rec. Num.	Num. of Homes	Ambient Sound Level at Time of Design	Ambient Sound Level at Time of Ultimate Hwy. 407	Sound Level With Hwy. 407 Initial Construction	Sound Level With Hwy. 407 Ultimate Design	Interim Impact (D - B)	Ultimate Impact (E - C)
1	10	58.0	62.2	70.0	75.0	12.0	12.8
2	2	45.5	47.5	56.7	60.5	11.2	13.0
3	5	50.3	53.6	55.0	60.5	4.7	6.9
4	1	56.1	58.1	59.6	65.8	3.5	7.7
5	6	48.5	53.5	55.6	57.3	7.1	3.8

A table summarizing the impacts by sound level increase and absolute sound level will be prepared as follows:

(Sample) Table 2a - Summary of Interim Noise Impacts

Change in Sound Level in dBA	Absolute Sound Level in dBA					Total
	45.0 to 49.9	50.0 to 54.9	55.0 to 59.9	60.0 to 64.9	Greater than 65.0	
0.0 to 4.9	7	5	7	2	6	27
5.0 to 9.9	0	4	6	4	3	17
10.0 to 14.9	0	0	2	6	5	13
> 15.0	0	0	0	2	1	3
Total =	7	9	15	14	15	60

(Sample) Table 2b - Summary of Ultimate Noise Impacts

Change in Sound Level in dBA	Absolute Sound Level in dBA					Total
	45.0 to 49.9	50.0 to 54.9	55.0 to 59.9	60.0 to 64.9	Greater than 65.0	
0.0 to 4.9	9	6	9	6	10	40
5.0 to 9.9	0	6	8	5	4	23
10.0 to 14.9	0	0	4	7	6	17
> 15.0	0	0	0	4	2	6
Total =	9	12	21	22	22	86

4.0 CONSTRUCTION NOISE

The Proponent will abide by the construction noise requirements of the MTO/MOEE Noise Protocol. Some construction activities may produce some temporary annoying noises in NSA's. The Proponent will abide by municipal noise control bylaws unless otherwise approved by the municipalities.

The Proponent will require the contractor to keep idling of construction equipment to a minimum and to maintain equipment in good working order to reduce noise from the construction activities.

NSA's that are predicted to experience significant construction noise problems will be documented in a table (summarized by number). Potential mitigation measures to address construction noise concerns in NSA's will be identified. Construction noise constraints will be incorporated into the contract documents. This is consistent with the requirements of the MTO/MOEE Noise Protocol.

5.0 SUMMARY

The noise mitigation requirements are as follows:

1. Based on existing and approved residential development at the time of EA approval, mitigation will be provided under the following conditions when the noise level increases meet the following criteria:
 - A. when the cumulative impact of the facility is greater than a 5 dBA increase in sound levels above the future no Highway 407 scenario, as determined at the time of design for initial construction,
AND
 - B. noise mitigation must achieve a minimum reduction of 5 dBA, averaged over the first row of homes,
AND
 - C. the mitigation must be cost effective.
 2. Construction noise constraints will be incorporated into the contract documents. This is consistent with the requirements of the MTO/MOEE Noise Protocol.
-

1.0 INTRODUCTION

1.1 Background

Highway 407 was initially considered during the 1940's and 1950's and since that time, has been incorporated into the planning of all major transportation and land use decisions within the Greater Toronto Area (GTA). Construction of parts of **Highway 407 between Highway 403 in the City of Mississauga and Markham Road** in the Town of Markham (**referred to as Highway 407 Central**) was initiated during the 1980's. The need for the continuation of Highway 407 east of Markham Road with a transitway component, was determined through system planning work carried out in 1989 with the technically preferred route being identified in the route planning work undertaken by the Ministry of Transportation (MTO) in the early 1990's.

In the early 1990's, the Provincial Government implemented a program to accelerate the construction of Highway 407 Central in order to complete the freeway by 1998. However, there are no environmental approvals to continue Highway 407 east of Markham Road. Consequently, since 1993, the Town of Markham and the Regional Municipality of York have expressed concerns about the impact that traffic to/from Highway 407 Central will have on Markham Road through Old Markham Village.

In addition to the anticipated concerns relative to traffic impacts on Markham Road and other area roadways resulting from the temporary termination of Highway 407 at Markham Road, there are other prevailing transportation issues across the Metro-York/Durham boundary that will be exacerbated by the termination of Highway 407 at Markham Road. In particular, deficiencies in person-transportation capacity across the boundary will create traffic and environmental problems in hamlets and other communities in both Markham and north Pickering.

In 1996, the Ministry of Transportation carried out a **Feasibility Study** which concluded that:

- The termination of Highway 407 at Markham Road would cause significant traffic impacts to local roads and surrounding communities;
- There exists a significant transportation capacity deficiency across the Metro-York/Durham boundary; and
- A partial extension of Highway 407 from Markham Road easterly to Highway 7 east of Brock Road along the previously identified technically preferred route is the best transportation solution to resolve short term transportation requirements.

Provided in this document (**Appendix 23**) is a summary of the traffic engineering work undertaken for the *Environmental Assessment for the partial extension of Highway 407 east of Markham Road*. Additional details on the transportation component and planning alternatives are discussed in **Chapters 2.0 and 3.0** of the *Highway 407/Transitway Environmental Assessment Report (EAR)*.

1.2 Scope - Transportation Component

The scope of the transportation component of the Highway 407/Transitway Environmental Assessment consisted of defining the transportation problems to be addressed and summarizing the need and justification for the partial extension of the highway facility east of Markham Road from a traffic and transportation perspective. In addition to the need and justification component, the findings of the traffic analyses were a critical factor in the evaluation of the various alternatives to resolve existing and anticipated traffic concerns (i.e. Alternatives to the Undertaking).

It is important to recognize that the transportation planning work undertaken as part of this EA Study recognizes the transportation framework and direction established in the 1989 Overview Study while addressing changes in demographics, transportation infrastructure, commuting patterns, growth, etc. which have occurred since the Study was completed.

1.3 Transportation Study Area

For the purpose of the transportation component of the EA Study, the Transportation Study Area was defined as the area bounded by McCowan Road, Elgin Mills Road, Lake Ontario, and east of Brock Road, and is illustrated in **Exhibit A23.1**. A secondary Study Area which includes the GTA and surrounding municipalities was also established to ensure that an "area wide" perspective of the transportation issues and opportunities were considered.

2.0 OBJECTIVES

The transportation related objectives established as part of the EA Study for the partial easterly extension of Highway 407 are as follows:

- To confirm the need for the partial extension of Highway 407 easterly from Markham Road;
- To assess and identify short and long term transportation measures to address the prevailing and future transportation/traffic related problems across the Metro-York/Durham boundary and through the Highway 401 and Highway 7/407 corridors;
- To assess and identify measures required to mitigate the existing and potential traffic problems in residential communities within Markham and Pickering;
- To assess and identify measures required to mitigate the anticipated traffic related concerns in the Markham area resulting from the termination of Highway 407 at Markham Road;
- To identify and assess all reasonable planning alternatives to resolve the prevailing and future mobility problems across the Metro-York/Durham boundary and those anticipated by the termination of Highway 407 at Markham Road;
- To ensure that the proposed undertaking is compatible with the long term transportation system needs across the Metro-York/Durham boundary and within the Region of Durham as identified through earlier planning studies; and
- To ensure that the need to protect for long term transportation facility requirements (road and transit) within the proposed Highway 407/Transitway corridor is acknowledged through the traffic analysis.



TRANSPORTATION STUDY AREA

HIGHWAY 407 / TRANSITWAY
MARKHAM ROAD EASTERLY TO
HIGHWAY 7 EAST OF BROCK ROAD

3.0 ANALYSIS

3.1 Synopsis of Analysis Approach

Forecasts of future travel demands were developed using the MTO EMME/2 travel demand forecasting model developed by the Ministry of Transportation for modelling demand on provincial roadways and used to forecast travel demand on Highway 407 Central. For the traffic analysis summarized in this report, it was necessary to up-date the MTO network in the vicinity of Markham Road using the network from the Durham Region demand forecasting model. The Durham Region's model network is considered to be the most accurate within Durham, while the MTO network is considered the most accurate for the Region of York and the rest of the GTA. In consideration of this, the MTO EMME/2 model was revised to reflect Durham's network at the Durham west boundary.

The following should be noted regarding the model and the associated traffic analysis:

Screenlines and Corridors:

A screenline is an imaginary or real boundary across which all travel demand and capacity is totalled. Three major screenlines were used to analyse east-west travel through the Transportation Study Area and to assess the overall transportation "picture", they are:

- ***Screenline 1 - the Metro-York/Durham boundary from Elgin Mills Road to Highway 401***
This screenline has been used in numerous previous transportation planning studies undertaken within the GTA. It has also been recognized by area planners that the Metro-York/Durham boundary forms a traditional separation as it is located generally along the Rouge River corridor which is a natural barrier to east-west vehicular travel;
- ***Screenline 2 - west of Brock Road from Regional Road 5 to Bayly Street.***
This screenline was selected to assess the impact on east-west capacity as a result of extending Highway 407 easterly to Brock Road; and
- ***Screenline 3 - east of Brock Road from Regional Road 5 to Bayly Street***
Similar to Screenline 2, this screenline was selected to determine the short term and long term impacts of extending Highway 407 easterly to Brock Road. Specifically, it was necessary to assess whether extending Highway 407 to Brock Road would be sufficient in the short term and to identify long term needs, if any, for extending the highway east of Brock Road.

Within the above screenlines, there are *two major corridors* which have been reviewed: *Highway 401 and Highway 7/407*. While the overall transportation system was assessed on the basis of screenline problems, localized transportation issues/problems were also identified on a location specific basis, particularly in the area of the presently planned terminus of Highway 407 at Markham Road and on links through communities along Highway 7.

Time Period Used for Analysis:

The demand forecasting model used in the analysis summarized in this report is based on a.m. peak hour conditions. This is the typical time period used for transportation analysis purposes in the GTA as it can be more accurately modelled than the p.m. peak hour. During the a.m. period, there is a high percentage of commuter work trips which can be modelled with greater reliability than trips in the p.m., which tend to be less predictable. Although the a.m. peak hour was used in the analysis, consideration of the mobility requirements/opportunities for recreational travel was also undertaken.

Planning Horizons and Alternatives Tested:

Auto assignments were prepared using the EMME/2 model for each of the three horizon years: 1998, 2011, and 2021. The 1998 planning horizon was selected as Highway 407 Central and the widening of Highway 401 to Brock Road are both to be completed by 1998. As for the 2011 and 2021 planning horizons, both years have been used in many other planning studies undertaken in the GTA and are the basis for the majority of the area demand forecasting models (MTO, Durham, Metro) as well as municipal Official Plan documents. It should be noted that even though the model is based on auto-based assignments, transit usage assumptions have been included which allowed for the assessment of future transit deficiencies/requirements, see **Sections 3.2 and 4.2**.

As part the Feasibility Study, several options for the partial extension of Highway 407 were analysed, including extending Highway 407 to Brock Road/Highway 7, to the Markham By-pass, to 9th Line, and to the Durham-York Line. *The findings of the Feasibility Study concluded that the preferred alternative would be to undertake a partial extension of Highway 407 easterly of Markham Road to Brock Road/Highway 7.* As a result of the findings of the Feasibility Study and the traffic analysis carried out for this Study, the following *two scenarios for Highway 407 were considered for the 1998, 2011 and 2021 planning horizons*:

1. Completion of Highway 407 to Markham Road; and
2. Completion of Highway 407 to Markham Road along with a partial extension of Highway 407 easterly to Brock Road/Highway 7.

3.2 Existing Conditions

3.2.1 Roadway

The road authorities within the primary Transportation Study Area include the Ministry of Transportation, Region of Durham, Region of York, Town of Pickering, Town of Ajax and Town of Markham. The Provincial highways, Regional roads and Town arterial roads together form a hierarchical grid system of roads in the Transportation Study Area.

There are numerous discontinuities in the east-west road network through the Transportation Study Area particularly across the Metro-York/Durham boundary. More significantly, there are limited opportunities for reducing or eliminating these discontinuities to provide additional east-west capacity. *The only remaining opportunities to provide significant additional east-west arterial capacity appears to be the 14th Avenue/5th Concession and Steeles Avenue/Taunton Road connections.* Widening of Highway 7 east of 9th Line in Markham is not possible without significant "physical" impact to the communities of Locust Hill, Green River and Brougham along with some major environmental impacts.

It has been well documented and concluded in other planning studies undertaken in the GTA, a number of which are discussed in **Chapter 2.0 of the EAR**, that *travel demands across the Metro-York/Durham boundary are continuing to increase in spite of the prevailing and anticipated congestion levels which are resulting in extended peak travel periods in the morning and afternoon.* These studies have also found that the current deficiencies across the boundary have resulted in drivers searching for other alternative routes and using local roads, particularly those through small communities (Whitevale, Box Grove, Greenwood) and through the Rouge Valley Park (Twyn Rivers Drive, Finch Avenue).

The travel demand pressures at the boundary are a result of a combination of the demands from a number of different users including commuters, commercial vehicle operators, long distance highway travellers and recreational travellers. Travel studies along Highway 401, east of Durham Region, show that traffic is growing at a sustained rate of 3 to 4.8% per year. This is expected to continue for the foreseeable future. This growth is a result of continued increases in inter-provincial movement of goods, recreational traffic and commuter traffic destined to the GTA, with some growth due to local residential development in Newcastle and Port Hope. This growth at the east end of Durham Region, contributes, in part, to the continued growth in cross-boundary demands at the Metro-York/Durham boundary.

Commercial vehicle travel has grown at a significant rate across the boundary in absolute numbers. Based on historical cordon counts, commercial vehicle travel has increased from approximately 1,700 to 3,700 vehicles (6:30 - 9:30 a.m.) over the period from 1975 to 1995. However, travel during peak periods has remained relatively constant as a percentage of total travel (between 9 to 11%), primarily due to levels of congestion, which commercial and recreational vehicle operators attempt to avoid. However, with the continued lengthening of the peak periods, it is becoming more and more difficult for commercial vehicles to avoid congestion. Continual increasing delays to commercial vehicles delivering goods within the GTA and to other parts of Ontario will ultimately result in increased costs to consumers.

Recreational travel along the Highway 401 corridor represents a major demand during the summer months (May to September). In the east end of Durham Region, summer weekday traffic on Fridays can be as much as 42% higher than summer mid-week volumes. Given the prevailing congestion levels on an average weekday, this increase in demand results in major delays for all vehicles in the Highway 401 corridor and also negative impacts in the form of traffic infiltration, particularly in South Pickering communities. Highway 7 is also a significant recreational travel corridor for travellers heading to the Kawartha and Trent Waterway recreational areas. Consequently, greater person travel delays will eventually result in increased societal cost in terms of lost productivity and environmental impacts from vehicle emissions.

3.2.2 Transit

In addition to roadway facilities, east-west cross boundary travel demands are also served by existing transit services. Specifically, GO Transit currently provides rail service on the Lakeshore East line as far as Oshawa as well as bus service between communities in Durham Region and Metropolitan Toronto along the Highway 2 and Highway 401 corridors. At the time of this Study, GO Transit had no plans to expand their rail or intercity services. VIA Rail also provides passenger rail service on the Lakeshore East line; however, it is primarily for inter-city trips and does not serve as a commuter function between the Region of Durham and Metropolitan Toronto. There are no current plans to upgrade this service whereby it could play a greater role as a commuter service.

Municipalities in the Transportation Study Area also provide traditional transit services within their boundaries including Pickering, Ajax, and Markham. Within both Pickering and Ajax, the majority of transit services are oriented to the GO stations during peak periods. Currently, the Region of York is investigating the viability of Regional Transit Services which would replace existing local services while Durham Region, in conjunction with the area municipalities, is investigating ways of improving Intermunicipal bus service.

It is important to recognize that the existing transit infrastructure within the Transportation Study Area is operating very close/at capacity during the a.m. peak hour and there are currently few opportunities for further reduction in auto use.

3.2.3 Community Impacts

While the focus is on cross-boundary travel conditions, consideration has also be given to travel conditions at Brock Road and in sensitive local areas such as established rural and urban communities in the Highway 7 corridor.

Markham Road/Highway 7 Area:

The Markham Road/Highway 7 area currently experiences severe capacity deficiencies, which are expected to be exacerbated by the opening of Highway 407 to Markham Road in 1998. The following summarizes the existing traffic conditions on roads in the Markham Road/Highway 7 area:

- **Markham Road** both north and south of Highway 7 is currently operating at or close to capacity in the a.m. peak hour in the southbound direction. The intersection at Markham Road and Highway 7 is currently operating at level of service "F" which reflects "fully congested" conditions;
- **Highway 7** west of 9th Line is currently operating under congested conditions during the morning peak hour. This congestion continues past Markham Road;
- **14th Avenue** east of Markham Road is operating at or close to capacity, particularly in the area of the 9th Line intersection in Box Grove; and
- **Steeles Avenue** operates at capacity along its length between Markham Road and Durham-York Line. Steeles Avenue is currently under construction from McCowan Road to the Durham-York Line and is being widened from 2 to 4 lanes. It is **not** anticipated that the widening will be complete by 1998 since construction has been deferred between 11th Line and Tapscott Road. As a result, Steeles Avenue will continue to represent a major "bottleneck" to travel across the boundary. The constraints on Steeles Avenue result in traffic being forced to redistribute to other less desirable roadways in the area such as 14th Avenue, 9th, 10th and 11th lines, and Finch Avenue.

Local Communities in the Highway 7/407 Corridor:

- **Locust Hill** is located along Highway 7, east of 10th Line in Markham. This community is affected by the heavy traffic volumes along Highway 7 during both morning and afternoon peak periods;
- **Box Grove** is situated along 14th Avenue, at the 9th Line in the Town of Markham. As noted above, 14th Avenue is at or close to capacity, with heavy traffic affecting the community during both peak periods;
- **Green River**, in the Town of Pickering, is located along Highway 7 just east of the Durham-York Line. The community of **Brougham** is located along Highway 7 at Brock Road in Pickering. Highway 7 at both locations is at or close to capacity during both morning and evening peak periods;
- **Whitevale** is located along Whitevale Road (Concession Road 5) in the Town of Pickering. Whitevale Road is heavily travelled during morning and evening peak periods by commuters avoiding congestion on Highway 7 and Steeles Avenue; and
- **Greenwood** is located south of the existing Highway 7 bypass of Greenwood, and west of Westney Road in the Town of Pickering. This community is affected by commuters short-cutting through the community on 6th Concession going to and from Highway 7 during both morning and evening peak periods. It should be recognized that the Town of Pickering is currently investigating traffic calming methods and local roadway improvements in Greenwood.

3.3 Transportation Demand Forecasting Model

As previously stated, the demand forecasting tool applied in this Study was initially developed for forecasting travel demand on Highway 407 Central. *The MTO demand forecasting model is now being used by the Ministry on many planning studies within the GTA.* In addition to MTO's model, surrounding municipalities have also developed forecasting models including Metropolitan Toronto, Durham and York Regions. For this EA Study, an audit of the MTO model was completed by comparing future screenline volumes with those projected from the Durham Region model as well to those identified in other studies which utilized the Metropolitan Toronto demand forecasting model. The audit confirmed that the three models are consistent with each other and that *the MTO model is considered an appropriate tool for assessing travel demand in the GTA and the associated affects of modifications to the transportation network, including those to Highway 407.*

Even though forecasted volumes from the MTO model were considered to be a reasonable representation of future conditions, it is important to understand that all forecasting models are planning tools and that engineering judgement is still required when reviewing the results. Furthermore, the model is based on a.m. peak hour conditions which in some circumstances does not reflect peak travel conditions. It should be noted that a.m. peak hour volumes may be conservative (i.e. slightly lower than) in comparison to the p.m. peak hour volumes. For example, on Highway 7 just east of Markham Road, the 1994 a.m. peak hour westbound volume is 83% less than the eastbound p.m. peak hour volume.

3.3.1 Forecasting Process

MTO's trip matrices for the a.m. peak hour, based on existing (i.e. 1993 base year) trip making characteristics and forecasted population and employment levels for the years 1998, 2011 and 2021, were used in conjunction with the EMME/2 model software. The 1993 trip matrix was based on person travel demand and then adjusted to auto travel by removing other modes. *The future year matrices were originally derived from a blend of 1986 and 1993 Transportation for Tomorrow Survey (TTS) data (source: Data Management Group, University of Toronto)* using a Fratar adjustment or factoring procedure.

TTS trip rates were used for generating a.m. peak hour matrices for all purpose auto drivers. The a.m. peak hour trips were then assigned to the road networks using the same procedure and the same volume-delay functions (capacity indices) used for the Highway 407 Central modelling. No factors were required to account for mode split, vehicle occupancy or non-work trips as these factors are inherent in the auto driver trip generation data.

For 1993, trip rates were applied for individual zones while for future years, trip rates were applied on an aggregated Regional basis. A basic assumption used from the TTS data is a conversion from a.m. peak period (3 hours) to a.m. peak hour of 0.40 which has been built into the matrices. The auto occupancy assumption for the base year and future years is 1.20 occupants per vehicle which is a conservative estimate given the auto occupancy in the Study corridors is in the range of 1.12 to 1.14 (based on 1993 to 1995 cordon count data).

The model generates future vehicle trips and vehicle-kilometres of travel on the roadway network (arterial and highway) for the GTA, including Highway 407. The model processes and assumptions that have been employed in generating traffic volumes for this exercise are consistent with those applied by MTO in the modelling for Highway 407 Central.

3.3.2 Network Updates

As previously discussed, the MTO a.m. peak hour model network was updated using the Region of Durham's model network in the areas of east Metropolitan Toronto and York, and in west Durham. For the 1998 conditions, no modifications were made to the existing road network with the exception of the addition of the Highway 401 widening completed to Brock Road (to 12 lanes) and the Steeles Avenue widening to 4 lanes west of the Metro-York/Durham boundary.

For 2011 and 2021 assignments, no changes to the road network were assumed other than the completion of Highway 407 Central and the extension of the Markham Bypass south to meet Highway 407 (where applicable).

It should be recognized that the networks, and other modelling assumptions utilized in this Study have been reviewed and endorsed by staff from MTO, the Regions of Durham and York, City of Scarborough and Town of Markham. The area municipalities concur that the roadway network is a true representation of existing and future conditions in the Transportation Study Area.

3.3.3 Road Link Friction Factors (Volume Delay Functions) and the Equilibrium Assignment Process

Volume delay functions (vdfs) are derived from a parabolic curve equation representing vehicle delay which is used in the model to *determine delay on roadway links*. The EMME/2 software uses the vdfs to determine travel paths during each assignment iteration.

The equilibrium assignment process used in the EMME/2 software is designed to simulate the tendency of drivers to minimize trip duration by choosing road links based on the delay incurred. Iterations of the model are carried out until vehicles assigned to the network are no longer able to improve travel time by changing their routes.

3.3.4 Mode Split Assumptions

Current levels of transit mode split and cycling/walking use were incorporated into the model for all planning horizons. It has been assumed in the forecasting exercise that a 20% transit mode share of all cross-boundary trips could be achieved in the future. A 20% mode split to transit is a realistic estimate for short to medium term planning horizons given the current "state" of transit and transit facilities in the Transportation Study Area.

3.3.5 Transportation Demand Management (TDM)

As noted above, a 20% mode split has been assumed for the future planning horizons. Given that the existing transit infrastructure is at/near capacity in the a.m. peak hour, in order to achieve the existing mode split level in the future, it will be necessary to implement TDM measures and/or improve the existing transit infrastructure. The following provides a synopsis of TDM opportunities which were considered in the demand forecasting process.

- Reduced auto use in favour of transit, walking and cycling;
- Increased auto occupancy;
- Reduced frequency of trip making; and
- Reduced number of trips made during peak travel periods.

Based on the findings of the traffic analyses, it can be concluded that by the year 2011, the current transit infrastructure will not be able to support the assumed mode split indices.

3.3.6 Population and Employment Assumptions

Population and employment assumptions used to develop the future trip matrices are based on the *Hemson Scenario 1 forecasts developed by the Office of the GTA (source: Population and Employment Outlook for the Greater Toronto Area, Hemson and Coopers & Lybrand, August 1993)* and are summarized in Table 3.1. The 1998 forecasts are interpolated from the Hemson forecasts. The Hemson Scenario 1 forecasts are based on employment to population ratios for each Region. These ratios consider a continuation of the concentration of employment within Metro Toronto with some increases in the outlying Regions to account for increased self-containment, so as to make most efficient use of the existing infrastructure, particularly the TTC and GO systems.

The Hemson Scenario 1 population and employment forecasts used for this Study have been accepted by the area municipalities/Regions on a municipal basis; although, it should be recognized that within each municipality, there have been different assumptions for local distribution. Sensitivity testing was carried out to assess the impacts of the different local distribution assumptions in the Region of Durham, the results of which are discussed in Section 5.5.

TABLE 3.1 HEMSON - SCENARIO 1 FORECASTS						
Year	Population			Employment		
	Durham	Metro	York	Durham	Metro	York
1991	409,000	2,276,000	505,000	156,000	1,368,000	248,000
1998	546,000	2,389,000	682,000	204,000	1,482,000	336,000
2011	800,000	2,541,000	970,000	305,000	1,680,000	496,000
2021	952,000	2,702,000	1,107,000	366,000	1,800,000	578,000

Of particular relevance to this study are the population and employment assumptions for two major development areas in the Highway 407 corridor: Seaton and Cornell. The Cornell community is expected to develop to a population of 30,000 by the 2021 planning horizon. For the Seaton community, the planning for Highway 407 Central assumed that a population of 90,000 will be achieved by the year 2021. For consistency, this assumption was carried forward to this Study and used in the traffic analysis. It is recognized that the Durham Region Official Plan set a population target of 45,000 for Seaton for the year 2021. It is fundamental to note that the lower population target has little or no effect on the findings of the traffic analysis with respect to the need and justification work carried out for the partial easterly extension of Highway 407.

It should be noted that there was no assumption regarding development of the Pickering Airport included in the population and employment forecasts. However, should the Pickering Airport be developed, then there will be a major change in travel demands in the Highway 7 corridor; in particular:

- If the airport is developed as a regional airport, there will be traffic associated with airport operations as well as passenger and cargo operations; and

- If development of an international airport occurs, there would be high growth in airport related traffic and major changes in surrounding land uses, along with airport related industrial development, thereby creating a major employment centre or node.

Under both scenarios, there will be a travel demand in the Highway 7 corridor which could not be served, given the current planned transportation infrastructure.

3.3.7 Road Tolling Assumptions

The model has been developed to forecast travel demands on Highway 407 east of Markham Road assuming that it will be operated as a toll facility. The same toll assumptions were applied to this project that were used to model travel demand on Highway 407 Central. It is important to note that should the roadway not be considered a toll facility, the demand for its use would be greater, possibly by 15 to 20 percent. However, the overall results of the traffic analysis completed for this Study would not significantly change if tolls were eliminated, since the tolls do not impact the overall deficiencies that will be realized on the transportation network within the Study Area.

3.3.8 Calibration

The network was a combined version of MTO's base (1993) network and the network from the Durham model. Modifications were made to adjust for known changes in these characteristics to better reflect the base network in the Transportation Study Area. As part of the calibration process, the base network was reviewed in detail in terms of link assumptions such as speed, capacity, number of lanes, and location of centroid (zone) connectors.

Comparison of 1993 assigned volumes with traffic counts showed similar results to those of the Highway 407 Central modelling exercise, for a screenline along the Metro-York/Durham boundary. A more detailed examination of screenline crossings in the current model showed that calibration in Pickering and across an east-west screenline south of Highway 7 in York Region is sufficient to meet the objectives of this study.

The auto demands along the north-south corridor west of the Metro-York/Durham boundary (east of Birchmount Road and south of Steeles Avenue) and along the east-west corridor across the Metro-York/Durham boundary north Highway 401 are under estimated by the model. This is not unexpected since a model utilizing global factors (such as peak hour to peak period factor of 0.40) for the entire GTA can be expected to over (or under) represent some areas that deviate from the average. For this Study, the model has been refined to minimize as much as possible the impacts of over and under estimating.

4.0 FINDINGS OF THE TRANSPORTATION ASSESSMENT

4.1 Future Travel Demands

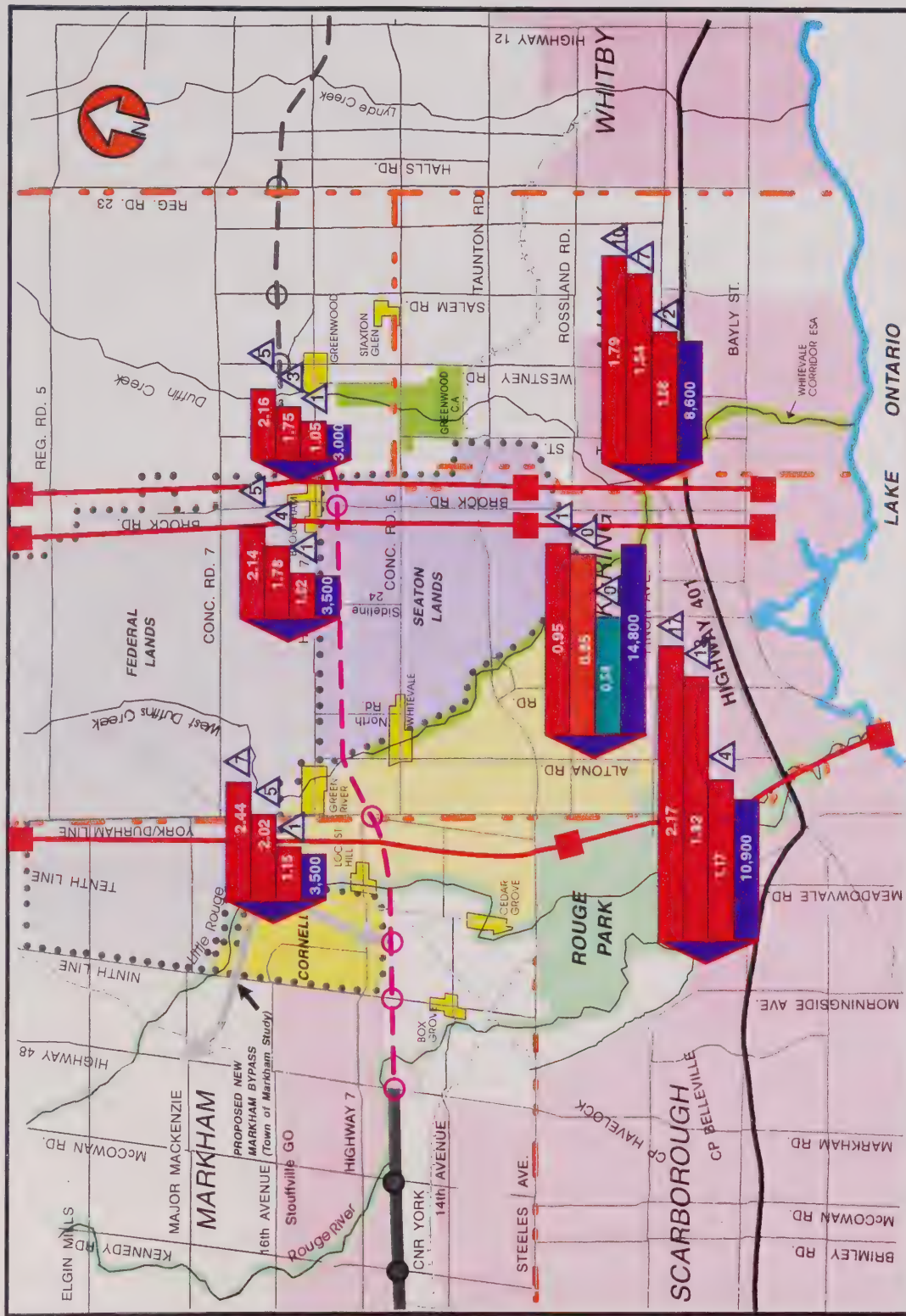
Summarized in the Table 4.1 and shown on Exhibit A23.2 are the screenline volume to capacity ratios and arterial lane deficiencies for 1998, 2011 and 2021 for the completion of Highway 407 Central (i.e. to Markham Road). The results have been categorized into the three north-south screenlines for Highway 401 and Highway 407 corridors.

When reviewing the results identified in Table 4.1, it should be recognized that a volume to capacity ratio of 0.9 is considered to represent capacity.

<p>TABLE 4.1 FUTURE A.M. PEAK HOUR (WESTBOUND) - AUTO TRIP AND ARTERIAL LANE DEFICIENCIES HIGHWAY 407 TO MARKHAM ROAD</p>									
	SCREENLINE								
	Metro-York/Durham Boundary			West of Brock Road			East of Brock Road		
	Hwy 401 Corridor	Hwy 407 Corridor	Total	Hwy 401 Corridor	Hwy 407 Corridor	Total	Hwy 401 Corridor	Hwy 407 Corridor	Total
Screenline Capacity (vph)	10,900	3,500	14,400	14,800	3,500	18,300	8,600	3,000	11,600
Planning Horizon	v/c (Arterial Lanes Deficient)			v/c (Arterial Lanes Deficient)			v/c (Arterial Lanes Deficient)		
1998	1.17 (4)	1.15 (1)	(5)	0.58 (0)	1.02 (1)	(1)	1.08 (2)	1.05 (1)	(3)
2011	1.82 (13)	2.02 (5)	(18)	0.85 (0)	1.78 (4)	(4)	1.54 (7)	1.75 (3)	(10)
2021	2.17 (17)	2.44 (7)	(24)	0.95 (1)	2.14 (5)	(6)	1.79 (10)	2.16 (5)	(15)
<ul style="list-style-type: none"> v/c - volume to capacity vph - vehicles per hour Highway 401 widening to 12 lanes to Brock Road has been included in 1998 conditions Lane deficiency based on the capacity of an arterial lane which is 800 to 900 vehicles per hour per lane (vph/lane) Highway 401 lane capacity across the Metro-York/Durham line calculated as 1600 vph/lane due to roadway grade and adjustments required for truck traffic. Base lane capacities considered (prior to adjustments for road grade) <ul style="list-style-type: none"> - Freeway (1800 vph/lane) - Highway standard arterial and/or Rural Highway (900 vph/lane) - Urban arterial (800 vph/lane) - High standard collector (650 vph/lane) - Collector (400 vph/lane) 									

Based on the review of the above capacity deficiencies in the 1998 planning horizon, it is clear that even with the widening of Highway 401 to 12 lanes to Brock Road, there are still east-west capacity deficiencies across all three screen lines.

Although the premise behind the proposed undertaking is to minimize the impact of terminating Highway 407 at Markham Road on local area communities and to address existing and future deficiencies across the Metro-York/Durham boundary and through the Study Area, *there is also a need to assess the justification for the proposed partial extension of Highway 407 in the wider Regional and Provincial context.* As a result, the need for the facility must also consider engineering, social and natural environmental, and economic factors. In consideration of this, the following *planning alternatives (i.e. Alternatives to the Undertaking) were established and assessed* considering the various factors. For a comprehensive discussion of the planning



1998	2011	2021
0.50	0.83	1.12
15,600	15,000	15,600

HIGHWAY 407 / TRANSITWAY
MARKHAM ROAD EASTERLY TO
HIGHWAY 7 EAST OF BROCK ROAD

NUMBER OF ARTERIAL
LANES DEFICIENT

FUTURE A.M. PEAK HOUR AUTO TRIP
DEFICIENCIES AND ARTERIAL LANE
DEFICIENCIES WITH 4 LANE HWY 407
TO MARKHAM ROAD

EXHIBIT
A23.2

alternatives and assessment, refer to **Chapter 3.0** of the EAR.

- a. *The Do Nothing Alternative* - this alternative was included to provide a base to permit comparison with the other planning alternatives. Under this planning alternative, no measures were considered to improve or increase vehicular and/or person trip capacity in and through the Durham Region and across the Metro-York/Durham boundary. However, it should be recognized that the "Do Nothing" alternative does assume that Highway 407 to Markham Road and the Highway 401 widening to Brock Road in Pickering, will both be completed by 1998.

Summary of the Assessment - the "Do Nothing" alternative will not alleviate the existing travel demand deficiencies across the Metro-York/Durham boundary nor will it address traffic related problems that will arise as a result of the termination of Highway 407 at Markham Road. The "Do Nothing" alternative will not permit the area transportation network to address future travel demands whether they be accommodated on transit or on roads. This alternative would seriously impact the ability of the Regional Municipality of Durham to grow from both a population and employment perspective. This alternative will have a negative impact on recreational travel and goods movement. Although this alternative has no direct physical impacts on vegetation, wildlife, watercourses, and heritage resources, there will be adverse local air quality effects within communities as traffic and congestion increase. The social impacts with this alternative relate to the effects of increasing traffic volumes in communities producing noise, dust and mobility problems. *The "Do Nothing" alternative is not a practical solution to the problems being addressed in the context of this Study.*

- b. *Improve Transit Services (Interregional, Regional, Intermunicipal, GO and Rail Transit)* - this alternative would include, but not be limited to, the following opportunities:
- The expansion of GO Rail services along the Lakeshore Corridor including an extension into Clarington and/or;
 - The establishment of commuter rail service on CP Rail's Havelock or Belleville Subdivisions;
 - The expansion of municipal transit service (i.e. TTC, Markham, Pickering etc.) and the establishment of regional transit systems in Durham and York;
 - The establishment of interregional transit services along the Highway 401 corridor;
 - The implementation of improved interregional service along the Highway 407 corridor; and
 - Greater use of existing heavy rail by commuters travelling between Durham and other destinations to the west in the GTA.

Summary of the Assessment - this alternative is not likely to reduce the trend of increased congestion in the local communities, resulting in increased deterioration of local air quality. Since with this alternative, roadway traffic demands will still increase, there will be similar social and economic impacts as described in the Do Nothing Alternative. Despite optimistic assumptions employed in the transportation analysis regarding future transit demand within Durham and York and across the Metro-York/Durham boundary, the reality is that transit system improvements will provide limited benefit in the short term and will not on their own represent a practical solution to the problems being addressed by this Environmental Assessment. *When reviewing the potential opportunities for transit improvements, however significant, these improvements, will not by themselves satisfy existing or future travel demands across the Metro-York/Durham boundary.*

- c. *Implement Transportation System Management Measures (TSM)* - TSM measures consist of various methods of maximizing existing infrastructure capacity. Such measures include the implementation of improved traffic signal timing equipment, improved signal timing and phasing, widening of intersections

to accommodate turning lanes, utilization of Intelligent Traffic Systems (e.g. Highway 401 Freeway Traffic Management System), etc. Such typical TSM improvements were considered for the existing major transportation routes crossing the Metro-York/Durham boundary and within Durham Region.

Summary of the Assessment - minor localized improvements on roadways within the Study Area could be affected with the implementation of Transportation Systems Management (TSM) measures. **However, minor intersection improvements and traffic signal optimization will not adequately address existing or future deficiencies in transportation system capacity.** This alternative will provide little or no benefit to recreational travel or goods movement. There is likely to be increased traffic on existing roadways and within local communities resulting in continued deterioration of local air quality. The social impacts with this alternative relate to the effects of increasing traffic volumes in communities producing noise, dust and mobility problems.

- d. *Promote Transportation Demand Management Improvements (TDM)* - TDM strategies can be grouped or aggregated into a number of broad categories including, voluntary efforts (ride sharing, trip chaining, improved telecommunications, activities scheduling, etc.) and regulatory efforts (parking controls, right-of-way reallocation and preferential treatment for HOV's, auto disincentives, etc.).

Summary of the Assessment - many TDM strategies would not be readily applicable to cross boundary trips originating from or destined to the Region of Durham because of the average length of trips, the current dispersion of trip destinations and the convenience factor associated with driving an automobile. Because of its anticipated limited effectiveness in reducing cross-boundary travel demand, there is likely to be increased traffic on existing roadways and within local communities resulting in continued deterioration of local air quality. The social impacts of this alternative relate to the effects of increasing traffic volumes in communities producing noise, dust and mobility problems. **TDM measures do not represent a practical solution to the defined short term problems on Markham Road and the deficiencies in transportation impacts across the Metro-York/Durham boundary.** This alternative will provide little or no benefit to recreational travel or goods movement.

- e. *Upgrade Arterial/Municipal Roadways* - the upgrading of existing regional arterials and/or municipal roadways would consist of road widening to increase the "through" lane capacity of existing facilities. This could also include the widening of existing roadways to provide for HOV or transit only lanes to increase the overall person trip capacity across the Metro-York/Durham boundary. A widening of Highway 7 was also considered in the context of the assessment of "planning alternatives".

Summary of the Assessment - this alternative has the potential for causing adverse effects on vegetation, wildlife, watercourses and heritage resources to the extent that new or expanded roadways are constructed. In the short-term, improved air quality in communities may be achieved as traffic volumes and congestion are reduced. However, in the longer-term local road improvements will be insufficient to address the increased demand and traffic volumes will increase, resulting in increased emissions and noise. In summary, **there is limited opportunity in both the short and long terms to affect capacity improvements across the Metro-York/Durham boundary using existing or future arterial roads.** Upgrading arterial roads will provide little or no benefit to recreational travel or goods movement.

- f. *Encourage Community Growth Management* - although this could be considered a TDM strategy, this issue was given separate status to reflect its future potential in terms of reshaping or influencing the trip making characteristics of Durham residents. Management of growth within Durham Region would consist of implementing planning and development strategies or policies to increase the employment to

population and live/work ratios within Durham thereby, reducing the number of work trips across the Metro-York/Durham boundary.

Summary of Assessment - the management of both population and employment growth in the Region or Durham has the potential in the longer term (+20 years) to have an impact on travel demand and cross boundary travel. ***In the short term and medium time-frames (up to 20 years), there will be limited opportunities to effect significant changes in travel patterns through growth management.*** This alternative will have limited direct physical impacts on vegetation, wildlife, watercourses, and heritage resources. However, there is likely to be increased traffic on existing roadways and within local communities resulting in continued deterioration of local air quality. The social impacts with this alternative relate to the effects of increasing traffic volumes in communities producing noise, dust and mobility problems. It will also limit the growth opportunities in the York and Durham Regions due to poor transportation access.

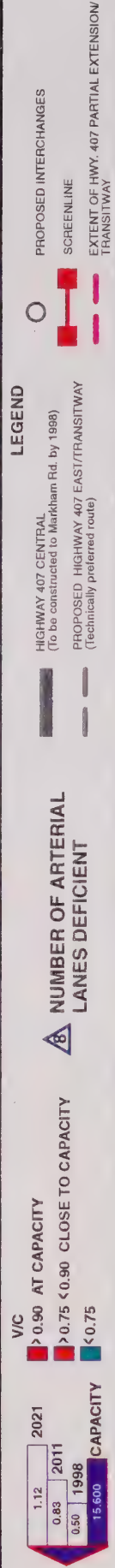
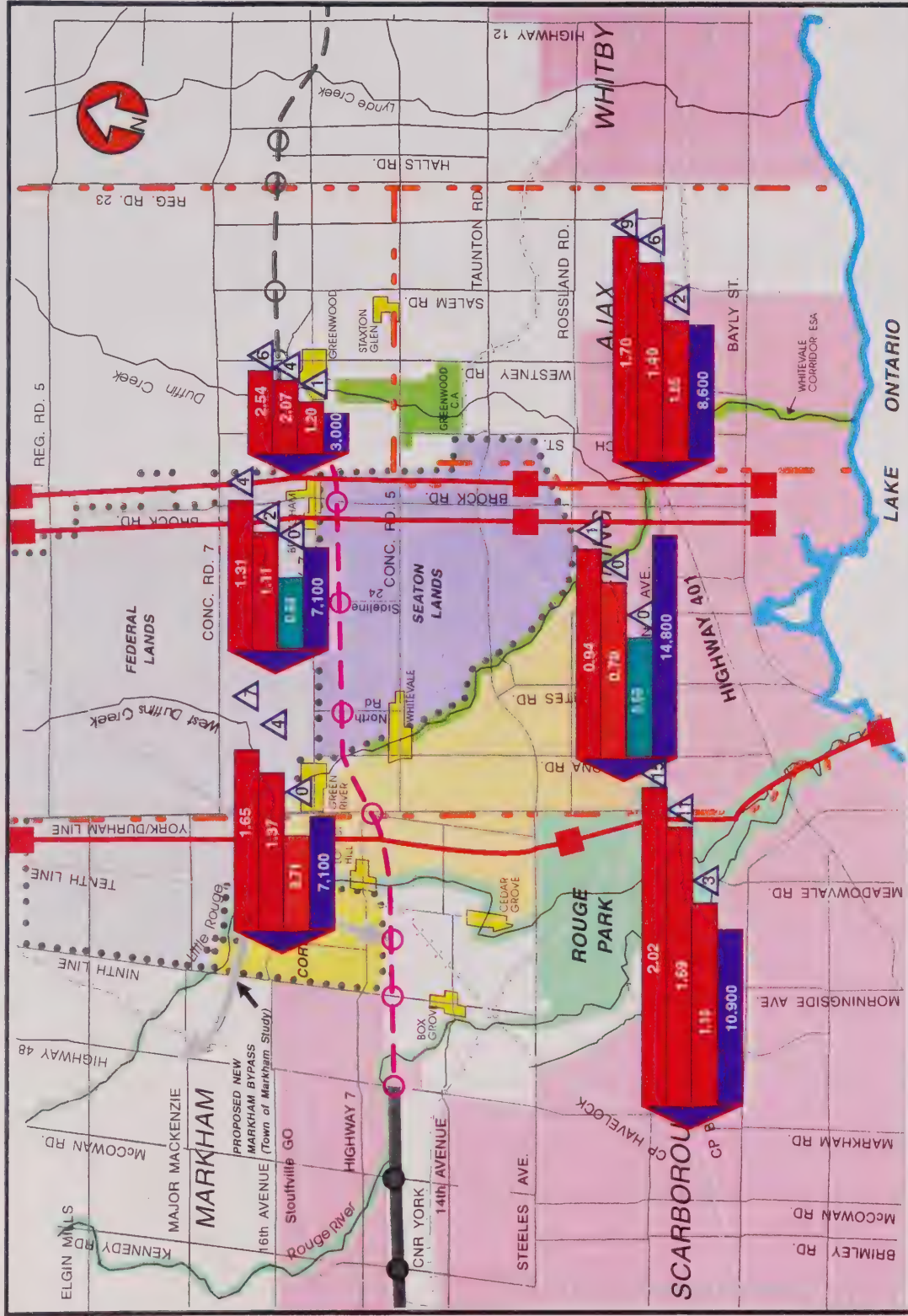
- g. *Extend Highway 407 Easterly (With protection for transitway facilities)* - the extension of Highway 407 easterly would involve the constructing a new section of Highway 407 easterly from Markham Road. The Highway 407 extension would initially consist of a four lane fully access controlled highway within a corridor protected to allow an ultimate ten lane cross section with a "higher order" transitway facility which would parallel the roadway.

Summary of Assessment - this alternative will have adverse effects on vegetation, wildlife, watercourses, and historical resources. There will also be some localized increase in traffic-related noise, however the reduced traffic and congestion within local communities will result in improved local air quality. The extension of Highway 407 easterly will provide significant relief to short term capacity constraints and will resolve community traffic problems in the area of Markham Road. ***This is the only planning alternative that will adequately satisfy existing transportation/traffic and social (community) issues.***

Based on the results of the synopsis provided above, ***extending Highway 407 (4 travel lanes) east of Markham Road was selected as the preferred planning alternative*** to resolve existing short term capacity deficiencies across the Metro-York/Durham boundary and traffic problems within communities in the Highway 7 corridor ("the problem"). The other planning alternatives considered within the assessment cannot, on their own, provide sufficient relief to cross boundary travel requirements in the short term.

Summarized in the **Table 4.2** and shown on **Exhibit A23.3** are the screenline volume to capacity ratios and arterial lane deficiencies for 1998, 2011 and 2021 for the partial extension of Highway 407 to Brock Road. The results have been categorized into the three north-south screenlines for the Highway 401 and Highway 407 corridors.

Based on the transportation/traffic analysis conducted for the future conditions, it can be concluded even with the 4 lane partial extension of Highway 407 to Markham Road, there will be east-west capacity deficiencies across the Metro-York/Durham and Brock Road boundaries. Therefore, it can be concluded that ultimately, Highway 407 will require additional widening from 4 lanes and extension beyond Brock Road.



<p>TABLE 4.2 FUTURE A.M. PEAK HOUR (WESTBOUND) - AUTO TRIP AND ARTERIAL LANE DEFICIENCIES HIGHWAY 407 TO BROCK ROAD</p>									
	SCREENLINE								
	Metro-York/Durham Boundary			West of Brock Road			East of Brock Road		
	Hwy 401 Corridor	Hwy 407 Corridor	Total	Hwy 401 Corridor	Hwy 407 Corridor	Total	Hwy 401 Corridor	Hwy 407 Corridor	Total
Screenline Capacity (vph)	10,900	7,100	18,000	14,800	7,100	21,900	8,600	3,000	11,600
Planning Horizon	v/c (Arterial Lanes Deficient)			v/c (Arterial Lanes Deficient)			v/c (Arterial Lanes Deficient)		
1998	1.10 (3)	0.71 (0)	(3)	0.55 (0)	0.60 (0)	(0)	1.05 (2)	1.20 (1)	(3)
2011	1.69 (11)	1.37 (4)	(15)	0.79 (0)	1.11 (2)	(2)	1.49 (6)	2.07 (4)	(10)
2021	2.02 (15)	1.65 (7)	(22)	0.94 (1)	1.31 (4)	(5)	1.70 (9)	2.54 (6)	(15)
See notes provided in Table 4.1.									

4.2 Network Deficiencies

4.2.1 1998 Planning Horizon

Highway 407 to Markham Road:

- When Highway 407 Central opens to Markham Road in 1998, there will be deficiencies across the Metro-York/Durham boundary even with the completion of the widening of Highway 401 to 12 lanes to Brock Road. Along the Highway 401 corridor there will be a deficiency of four arterial lanes while along the Highway 7 corridor, there will be a deficiency of one arterial lane. It should be recognized that although the deficiencies in the Highway 7 corridor may be only 1 lane, there are no opportunities to provide an increase in capacity in the Highway 401 corridor which has a deficiency of 4 lanes. The only opportunity to resolve deficiencies in the Highway 401 corridor is through improvements within the Highway 407 corridor;
- Without the partial extension of Highway 407 east of Markham Road, congestion will continue to increase on Highway 401. Following the widening of Highway 401 to 12 lanes to Brock Road, there will be no other opportunities to significantly increase capacity along the highway; and
- Between the Metro-York/Durham boundary and Brock Road along the Highway 401 corridor, there will be no overall deficiency across the screenline without Highway 407 extended to Brock Road/Highway 7. Along the Highway 7/407 corridor west of Brock Road, there will be a deficiency of at least 1 arterial lane.

Highway 407 to Brock Road:

- With the partial extension of Highway 407 to Brock Road, there will be no capacity deficiencies across the Highway 7/407 corridor west of Brock Road. The Highway 401 corridor however, will continue to experience a deficiency of 3 arterial lanes at the Metro-York/Durham boundary.

The greatest impact associated with not extending Markham Road will be on local roadways in the area of Markham Road and Highways 7 and 407 and within the communities and hamlets in the Highway 7 corridor east of Markham Road. Suggestions by some residents in Markham to terminate Highway 407 Central at a point west of Markham Road (such as McCowan Road) would *not* reduce projected traffic volumes in the communities or hamlets in the Highway 7 corridor.

4.2.2 2011 Planning Horizon

As can be seen by the projected volume to capacity ratios for the 2011 planning horizon, there are expected to be *major* capacity deficiencies crossing the Metro-York/Durham and Brock Road boundaries even with the 4 lane partial extension of Highway 407 to Brock Road. This is the case for both the Highway 401 and Highway 7/407 corridors.

Even though there will be screenline deficiencies in 2011 with the partial extension of Highway 407 to Brock Road, without the extension, there will be major impacts in local communities in the Region of Durham resulting from traffic infiltration.

It is important to recognize that once Highway 401 is widened to 12 lanes to Brock Road, there will be limited, if any, opportunities to effect capacity increases in the Highway 401 corridor. As a result, future system improvements must focus on the Highway 7/407 corridor for the areas west as well as east of Brock Road. More over, by the year 2011, the transit demand will be such that higher order transit facilities may be warranted and the only potential for such facilities will be in the area of Highway 407.

4.2.3 2021 Planning Horizon and Beyond

The transportation demand analysis indicates that significant additional road and transit capacity will be required at both the Metro-York/Durham boundary and east of Brock Road by 2021. Furthermore, it is expected that by the 2021 planning horizon, there will be severe traffic delays and congestion on Highway 7 east of Brock Road resulting from a termination of Highway 407 at Brock Road.

While no model was developed for a scenario beyond 2021, based on the best information available in the Hemson forecasts, there will continue to be major travel interactions between Durham, York, and Metropolitan Toronto. The GTA is expected to continue to be a major focus of industrial and business activity in Ontario. Therefore, while travel patterns may change and be mitigated by changes affected by TDM, TSM, and growth management strategies, the travel *demands in the both the Highway 401 and Highway 7/407 corridors will continue to grow.*

4.2.4 Summary of Deficiencies

The key problems and needs that have been identified through a detailed assessment of the existing and future transportation conditions, are summarized below:

- There is currently a need for additional a.m. and p.m. peak period roadway capacity across the Metro-York/Durham boundary. The existing capacity deficiencies will continue to increase over time and will not be satisfied by the widening of Highway 401 to 12 lanes to Brock Road;

- In 1998, with the termination of Highway 407 at Markham Road, existing capacity and operational constraints on Markham Road, Highway 7, 14th Avenue, and Steeles Avenue will be exacerbated. Communities along the Highway 7 corridor will be affected by spillover congestion, including Markham Village, Green River, Whitevale, Locust Hill, and Box Grove. To the east, Brougham and Greenwood will also be significantly affected by congestion on Highway 7;
- Unless there are major improvements to the transit infrastructure, transit ridership projections may not be achievable which may result in increased auto demand. Given the prevailing transit infrastructure, the available transit capacity across the Metro-York/Durham boundary and the limited plans to upgrade any of the existing systems in the short term (i.e. up to 2011), existing transit facilities may not be able to handle the projected demand. As a consequence, estimates of roadway capacity deficiencies across the Metro-York/Durham boundary may actually be understated for short-term projections;
- Construction of the partial extension of Highway 407 to east of Brock Road as a four lane facility to address immediate needs, in addition to the widening of Highway 401 to 12 lanes to Brock Road, will not alone address Metro-York/Durham boundary capacity requirements at the 2011 and 2021 planning horizons. As a result, there will be a need to ultimately upgrade Highway 407 to 10 lanes extending east of Brock Road in conjunction with other roadway improvements; and
- In order to accommodate future transit demands, significant improvements to the transit infrastructure will be required. This could include provision of higher order transit service across the Metro-York/Durham boundary. The only corridor suitable for such service is the proposed Highway 407 corridor. As a result, the Highway 407 corridor should include provision for higher order transit service (i.e. busway, LRT, etc.).

4.3 Highway 407 East - Future Volumes

Summarized in **Table 4.3** below are the projected **a.m. peak hour volumes (westbound)** on Highway 407 with the highway extended easterly from Markham Road to Brock Road for 1998, 2011 and 2021 conditions.

TABLE 4.3 PROJECTED HIGHWAY 407 A.M. PEAK HOUR VOLUMES (WESTBOUND) FROM MARKHAM ROAD TO BROCK ROAD (4 LANES)		
Planning Horizon	Location	
	Just east of Markham Road	Just west of Brock Road
1998	3,000 vph	1,100 vph
2011	5,000 vph	3,500 vph
2021	6,000 vph	4,000 vph

Summarized in **Table 4.4** below are the projected two way Annual Average Daily Traffic (AADT) on Highway 407 with the highway extended easterly from Markham Road to Brock Road for 1998, 2011 and 2021 conditions.

TABLE 4.4
PROJECTED HIGHWAY 407 ANNUAL AVERAGE DAILY TRAFFIC (TWO-WAY)
FROM MARKHAM ROAD TO BROCK ROAD (4 LANES)

Planning Horizon	Location	
	Just east of Markham Road	Just west of Brock Road
1998	30,500 vpd	12,500 vpd
2011	59,500 vpd	36,500 vpd
2021	74,000 vpd	45,000 vpd

4.4 Consistency of Findings with Other Studies

Over the last decade there have been a number of transportation and planning studies undertaken in west Durham and the eastern portions of Metropolitan Toronto and the Region of York that have dealt with the need for an extension of Highway 407 east of Markham Road or have included Highway 407 as an integral element in the transportation network in the Region of Durham.

Although many of these studies have employed or tested different assumptions relative to demographics, transportation demand management strategies, and network improvements, conclusions regarding the need for partial easterly extension of Highway 407 have been consistent. All of the studies undertaken in this area recognize the transportation related constraints in and around the Transportation Study Area and the need for addition east-west transportation capacity across the Metro-York/Durham Boundary. A number of these studies also recognize that a combination of roadway, transit and TDM improvements are required to satisfy transportation demands.

In addition to the above, long-range planning studies conducted at the Provincial, Regional and local jurisdictional levels, have identified the need for major transportation system (transit and road) improvements across the Metro-York/Durham boundary and within Durham Region, particularly in the Highway 7 corridor. It has long been recognized by the staff of the area municipalities, Durham and York Regions and by the Province, that a combination of road, transit and non-structural (transportation demand management, e.g. HOV lanes, growth management, etc.) system improvements will be required to resolve existing transportation problems and to address future transportation demands across the Metro-York/Durham boundary and through Durham Region.

4.5 Future Improvement Requirements

Based on the results of transportation/traffic engineering assessment, *it is recommended that Highway 407 be extended as a four lane facility east of Markham Road to Brock Road east of Highway 7 to resolve existing short term capacity deficiencies across the Metro-York/Durham boundary and traffic problems within communities in the Highway 7 corridor.* Below are some of the "key" reasons for the recommended planning alternative:

- In the short term, the partial extension of Highway 407 to just east of Brock Road provides the maximum relief to *existing community problems and east-west capacity constraints* across

the Metro-York/Durham boundary. Without the extension of this highway beyond Markham Road, existing communities will be seriously impacted by increased traffic volumes;

- The partial extension of Highway 407 represents a critical component in the future transportation networks for the Regions of Durham and York as previously identified in the Highway 407 Overview Study and the Regional Official Plans; and
- Improved transit services, TSM and TDM measures, upgrading of existing arterials and municipal roadways and community growth management within Durham, will not solve short term transportation problems.

Even though the partial extension of Highway 407 east of Markham Road as a 4 lane facility will provide significant east-west capacity across the Metro-York/Durham boundary, it will not be able to satisfy all cross boundary traffic demands in year 2011 and beyond. *The traffic analyses carried out for this Study has identified long term capacity deficiencies even with the provision of 10 lanes on the easterly extension of Highway 407.* In recognition of the findings of the traffic analyses and assessment of planning alternatives, it is recommended that the following long term transportation plan be considered:

- Protecting for long term transportation demands through the Transportation Study Area including a basic 10 lane Highway 407 and higher order transitway facility, with the understanding that other transit, road, TDM and growth management initiatives may all be required as part of a balanced transportation plan to satisfy mobility requirements across the Metro-York/Durham boundary.
- In order to accommodate future transit demands, significant improvements to the transit infrastructure will be required. This could include provision of higher order transit service across the Metro-York/Durham boundary. The only corridor suitable for such service is the proposed Highway 407 corridor. In recognition of the future transit demands, *there is a defined need to protect for a higher order transit facility or transitway which will parallel Highway 407.* Use of transit services will be a key to addressing future mobility demands and must form part of a balanced transportation plan for the Region of Durham and for travel across the Metro-York/Durham boundary. Both the future basic 10 lane freeway and the transitway will form part of a balanced transportation plan for Durham, York and Metro and will serve to partially address future travel demand requirements in the Highway 7/407 corridor.

5.0 CONCLUSIONS - TRANSPORTATION SYSTEM OPPORTUNITIES

Summarized in this section of the document are the main findings of the transportation assessment carried out for this EA Study:

5.1 Need and Justification

- In 1998, with the termination of Highway 407 at Markham Road, existing capacity and operational constraints on Markham Road, Highway 7, 14th Avenue, and Steeles Avenue will be exacerbated. Communities along the Highway 7 corridor will be affected by spillover congestion, including Markham Village, Green River, Whitevale, Locust Hill, and Box Grove. To the east, Brougham and Greenwood will also be significantly affected by congestion on Highway 7;

- Improved transit services, TSM and TDM measures, upgrading of existing arterials and municipal roadways and community growth management within Durham, will not solve short term transportation problems. Short and long term transportation deficiencies will not be mitigated by the implementation of TSM or TDM strategies. Even non-structural strategies to spread peak hours are not practical as the peak period already lasts for approximately three hours;
- Failure to address existing capacity constraints may result in a failure of the Region of Durham to achieve their employment projections which in turn will affect their ability to achieve their self-containment goals. This will in turn result in greater cross-boundary auto demands;
- From a transportation perspective, the extension of Highway 407 into Durham is clearly needed as one component to improve screenline capacity. Uncertainty with respect to development in Durham, the additional system improvements that may be effected in the next two decades and the success of TSM strategies suggests that an extension of Highway 407 be undertaken immediately to provide at least a basic 4 lane freeway facility; and
- In the short term, the partial extension of Highway 407 east of Markham Road provides the maximum relief to existing community problems and east-west capacity constraints across the Metro-York/Durham boundary.

5.2 Future Improvements/Future Extensions

- Construction of the partial extension of Highway 407 to east of Brock Road as a 4 lane facility, in addition to the Highway 401 improvements, will not alone address Metro-York/Durham boundary capacity requirements at the 2011 and 2021 planning horizons;
- As a result of anticipated and significant capacity deficiencies at both the Metro-York/Durham and Brock Road screenlines, the right-of-way for Highway 407 be protected to permit an ultimate 10 lane facility (consistent with future protection plans for Highway 407 Central) and that property be protected for a future high order transit system adjacent to the roadway; and
- With the 4 lane partial extension of Highway 407 to Brock Road, *in the short term there will be sufficient capacity along the Highway 7 corridor east of Brock Road to accommodate traffic demands*. However, by the 2011 planning horizon, it is expected that significant congestion will result on Highway 7 east of Brock Road as a result of spill over traffic from Highway 407. Therefore, it must be recognized that *by 2011, there will be a need for additional vehicular/person capacity along the Highway 7 corridor east of Brock Road to satisfy future transportation requirements in the Region of Durham*.

5.3 Need for Balanced Transportation Plan - Potential Role of TSM and TDM

As previously noted, a balanced transportation plan comprised of road, transit, and other TDM strategies will be required to deal with future transportation demands, particularly across the Metro-York/Durham boundary. The partial extension of Highway 407 represents only one component of a package of transit, roadway, and operational improvements which will be required to satisfy travel demands across the Metro-York/Durham

boundary and within Durham itself.

Therefore, a balanced long range transportation plan consisting of a "blend" of the easterly extension of Highway 407 in association with the other planning alternatives will be required to maximize east-west cross boundary capacity and would be consistent with the transportation networks defined in previous long range transportation planning studies. The implementation of a balanced long range transportation plan will also assist in satisfying local, regional and inter-regional transit objectives.

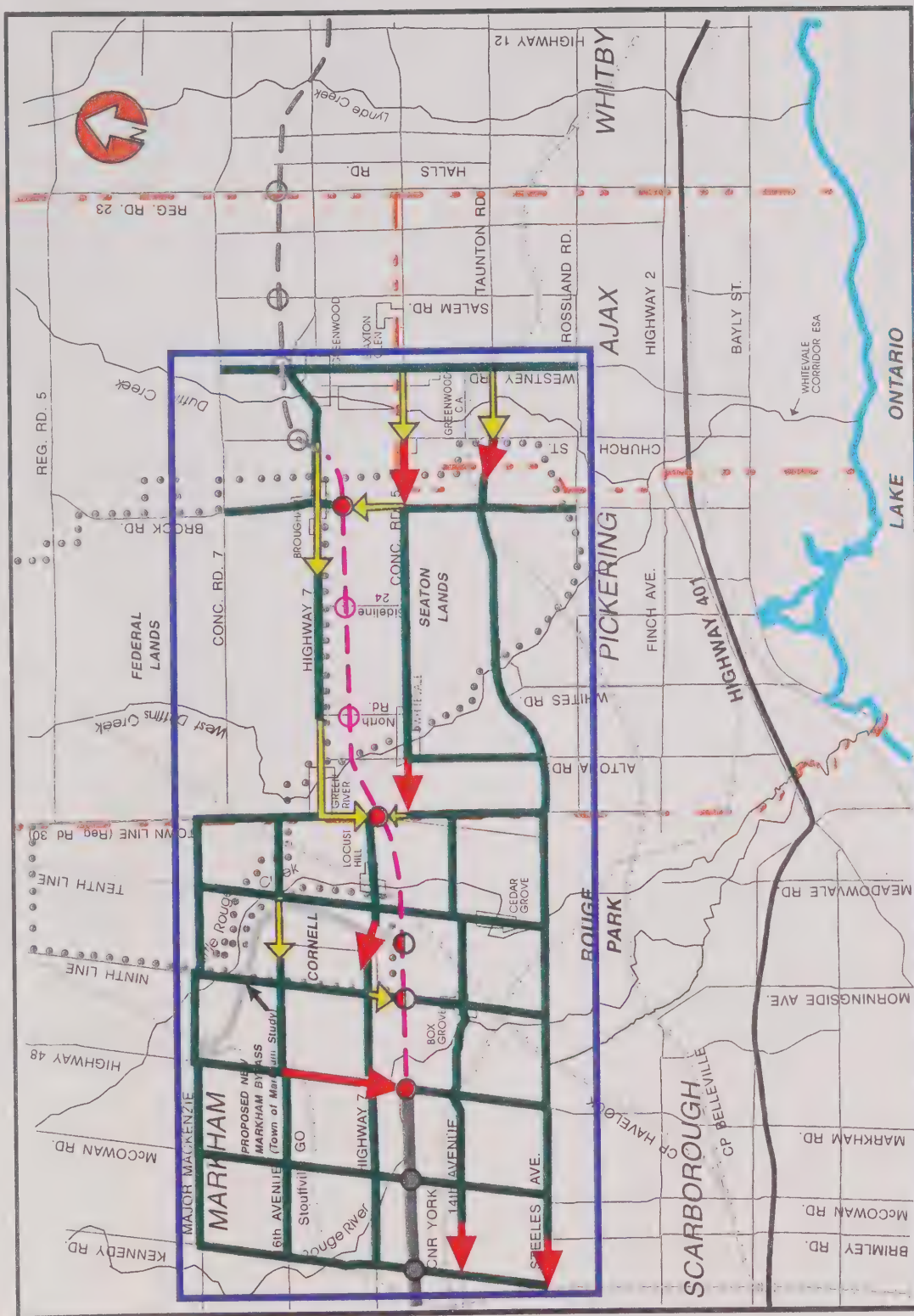
5.4 Summary of System Performance

Provided in **Exhibits A23.4 and A23.5** are the volume to capacity ratios for the main roadways within the Transportation Study Area for the 1998 and 2011 conditions with Highway 407 extended to Brock Road. Based on a review of the projected level of service conditions (volume to capacity of 0.9 considered to be at capacity), by the year 2011, the majority of the area roadways will be at capacity even with the partial extension of Highway 407.

5.5 Sensitivity Testing

To ensure that the trips generated by the forecasting model are reasonable and representative of existing and future conditions, the following "checks" were undertaken which are discussed below:

- A comparison of a.m. peak hour westbound trips generated by the MTO model and the Region of Durham forecasting model was undertaken for the 2011 and 2021 scenarios across the Metro-York/Durham boundary. The assessment was based on the same Regional population to employment levels with varying internal distribution assignments. It was found that by using either model and internal population and employment distributions, similar conclusions resulted regarding the need to extend Highway 407 east of Markham Road; and
- It has been assumed in the forecasting exercise that a 20% transit mode share of all cross-boundary trips could be achieved. In order to maintain a 20% transit mode share across the Metro-York/Durham boundary, major improvements to the transit infrastructure will be required as the current facilities are operating at capacity. As a consequence, estimates of future roadway capacity deficiencies across the Metro-York/Durham boundary may actually be understated for short-term projections. This finding further supports the need that property be protected adjacent to the Highway 407 corridor for a high order transitway.



LEGEND

- HIGHWAY 407 CENTRAL
(To be constructed to Markham Rd. by 1998)
- PROPOSED HIGHWAY 407 EAST/ TRANSITWAY
(Technically preferred route)
- EXTENT OF HIGHWAY 407 PARTIAL EXTENSION/
TRANSITWAY

- PROPOSED INTERCHANGES
- full
- north only
- south only

- $V/C > 1.0$
- $V/C > 0.9$
- $V/C < 0.9$

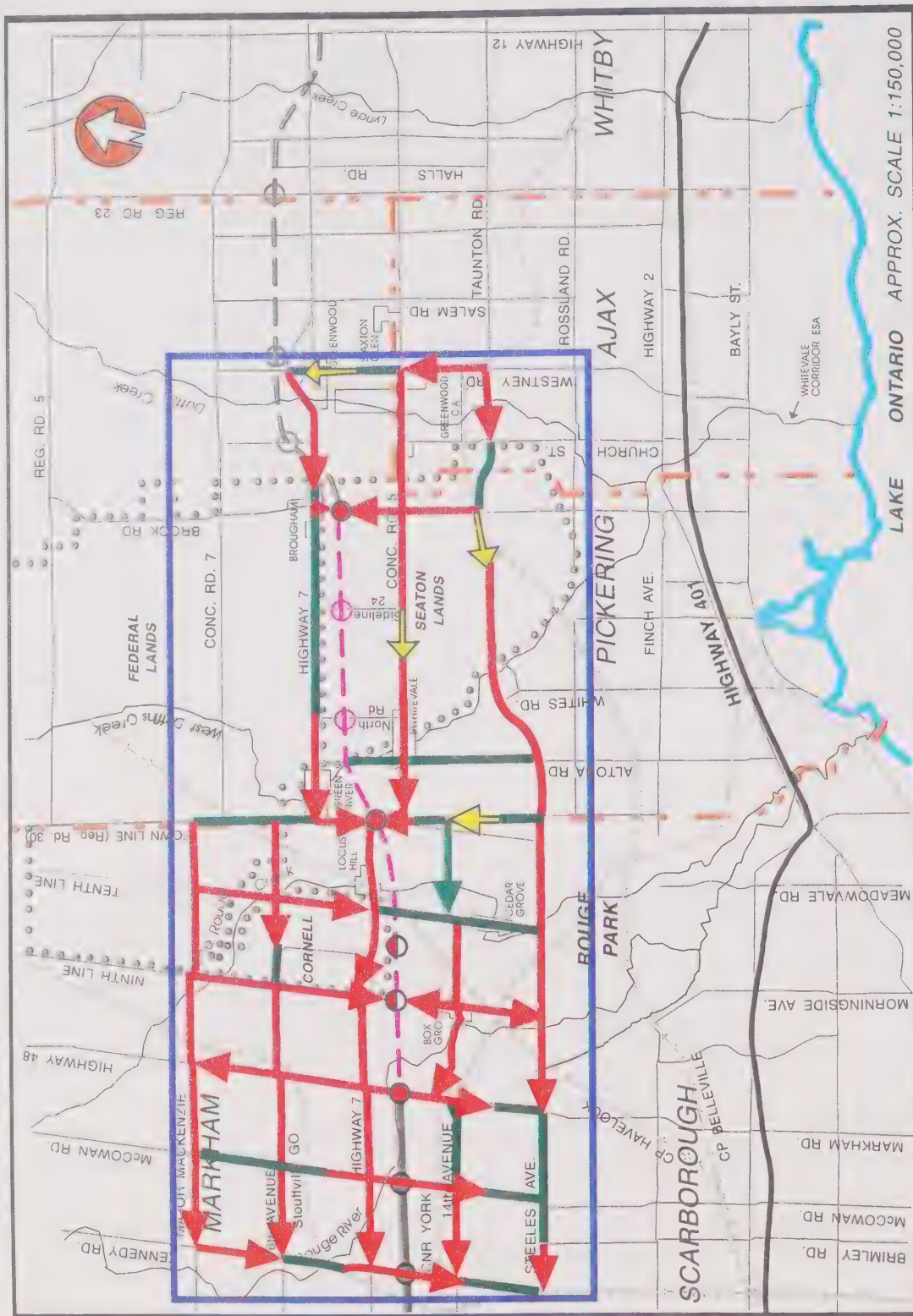
1998 HIGHWAY 407 to BROCK ROAD

1998

HIGHWAY 407 / TRANSITWAY
MARKHAM ROAD EASTERLY TO
HIGHWAY 7 EAST OF BROCK ROAD

VOLUME TO CAPACITY LINK RATIOS

EXHIBIT
A23.4



LEGEND

- HIGHWAY 407 CENTRAL
(to be constructed to Markham Rd. by 1998)
- PROPOSED HIGHWAY 407 EAST/ TRANSITWAY
(Technically preferred route)
- EXTENT OF HIGHWAY 407 PARTIAL EXTENSION/
TRANSITWAY
- PROPOSED INTERCHANGES
- full
- north only
- south only
- V/C > 1.0
- V/C > 0.9
- V/C < 0.9

HIGHWAY 407 to BROCK ROAD

2011

HIGHWAY 407 / TRANSITWAY
MARKHAM ROAD EASTERLY TO
HIGHWAY 7 EAST OF BROCK ROAD

VOLUME TO CAPACITY
LINK RATIOS

EXHIBIT
A23.5

APPENDIX 24
COMMENTS ON DRAFT EA

COMMENTS RECEIVED ON THE DRAFT EA

On December 9, 1996, a draft Environmental Assessment Report was circulated to Provincial and Federal Government Agencies for review and comment. The comments that were received were taken into consideration in the preparation of the Final EA Report.

Formal comments were received from the following Agencies:

Provincial

- ▶ Ontario Ministry of Agriculture and Food
- ▶ Ministry of Environment and Energy (MOEE)
- ▶ Ministry of Natural Resources (MNR)
- ▶ Metro Toronto Region Conservation (MTRC)
- ▶ Rouge Park Alliance (RPA)
- ▶ Ministry of Citizenship, Culture and Recreation
- ▶ North Pickering Development Corporation
- ▶ Ontario Realty Corporation

Federal

- ▶ Environment Canada
- ▶ Fisheries and Oceans (Fisheries and Habitat Management, Canadian Coast Guard)
- ▶ Canadian Transportation Agency

The Ministry wants to thank all those who reviewed the draft EA and provided comments. This Appendix contains a Table that provides the Ministry's response to the comments made by the reviewing agencies. The Table only includes those Agencies expressing concerns. Copies of the letters received from all agencies have been included after the Table.

MOEE COMMENTS	MTO RESPONSE
<ul style="list-style-type: none"> Ecosystem planning should be incorporated in EA There are numerous studies and watershed/subwatershed reports ... which are not reflected in the EA... Where such information is available you should be linking your activities to the watershed reports and their recommendations, and this information should be incorporated into the EA evaluation and documentation. The Stakeholder Consultation Process should clarify when stakeholders will be contacted, how much time will be allocated for review and input, and how the input will be used by the proponent. Lack of noise study Appendix 22 - noise Terms of Reference - is not consistent with the MOEE/MTO Protocol. 	<ul style="list-style-type: none"> The concept of ecosystem planning has been evolving over the years. In recognition of the importance of ecosystem planning, ecosystem impacts were included in the evaluation criteria used in the Route Planning Study. This is discussed in Chapters 4 and 5 and Appendix 1 of the EA. The Ministry of Transportation is also having ongoing discussions with the Ministries of Environment and Energy , and Natural Resources to develop a policy regarding the integration of ecosystem planning principles into future projects. New information has been produced and will continue to become available on the study area. This EA commits to a stakeholder consultation process that allows for new data to be tabled for consideration in the design process. It also ensures that stakeholders have the opportunity to participate at the design phase. It is recognized that additional information has been developed since the Route Planning for this undertaking was completed. The Stakeholder Consultation Process provides for consideration of new information during the design process. (Chapter 6 and Appendix 21) At this time it is not possible to determine the frequency of meetings or the require response time for any given issue. The Stakeholder Consultation Process commits to developing a schedule of meetings at the start of the process (Section 6.3.1). This will be done in consultation with the stakeholders. A two dimensional/flat earth noise study was carried out and the results are presented in Chapter 4 and Appendices 9-15. A meeting was held with MOEE Noise Assessment Staff and to discuss the noise issues. Appendix 22 has been amended to reflect MOEE's concerns and be consistent with the Protocol.

MOEE COMMENTS	MTO RESPONSE
<ul style="list-style-type: none"> • CHAPTER 1- 1 - The proposal to terminate at Hwy 7 east of Brock Road makes sense. 2 - It would be useful if the proponent provided examples of anticipated mitigation measures.... 3 - Be clear that this EA and the design and construction documents will apply to the complete 10-lane facility. 	<ul style="list-style-type: none"> • Noted • Examples of mitigating measures have been provided in Table 6.6.1. • The description of the undertaking in Chapter 1 indicates that the EA applies to the full 10-lane highway and the Transitway. The analysis has been carried out for the full facility. Mitigating measures that are developed during the design phase will be designed to protect for, and take into account the ultimate facility. Implementation however may be phased to correspond with the degree of impact associated with the phases of the undertaking.
<ul style="list-style-type: none"> • CHAPTER 2 1- The current document notes that the Transitway would be subject to an additional EA - Concerned that the noise studies would not necessarily include noise from a busway/light rail transitway. During development design this type of concern should be clearly and carefully assessed. 	<ul style="list-style-type: none"> • The Transitway is covered by this EA and no additional EA is contemplated. • The noise impacts of the transitway was considered during the noise analysis carried out for the Route Planning Study. It will also be part of the noise study conducted at detailed design.
<ul style="list-style-type: none"> • CHAPTER 3 1 - Add impacts on surface water and groundwater resources and stream crossings to Table 3.2.2 2- Need to incorporate other planning alternatives in Regional and Local Official Plans and land use development documents 	<ul style="list-style-type: none"> • “Surface and groundwater” has been added to the Table. Stream crossings are reflected in the row dealing with fisheries impacts. • This is a local consideration.

MOEE COMMENTS	MTO RESPONSE
<ul style="list-style-type: none"> 3- The third paragraph on p 3-20 is unclear... The EA should be, in part, the result of consultation with affected Regional municipalities regarding their long term land-use planning. 4- As an observation, alternative uses of existing transportation could prove beneficial... CHAPTER 4 1- Section 4.2.1 should recognize the importance of the Oak Ridges Moraine. 2- Pg 4-7 should make reference to the MOEE publication entitled "Stormwater Management Practices Planning and Design Manual", June 1994. <ul style="list-style-type: none"> - Add "The results and recommendations of the approved stormwater management study are to be implemented as part of the construction and highway maintenance activities" 3- ...include concern that installation of servicing conduits ... could interfere with groundwater movement. 4- Note the number and location of water wells. <ul style="list-style-type: none"> - Provide map of geological formations that provide water supplies and the wells in them. - Mitigation measures should be noted. 5- If (hydrogeological) field work has been completed, or will be undertaken, it should be referenced/made available in the final E.A. 	<ul style="list-style-type: none"> The point being made in the EA is that a balanced transportation system that includes the Highway 407/Transitway, is needed. This includes municipal transportation and land use initiatives. The affected municipalities have been involved throughout this project and considerable effort has been made to ensure that provincial and municipal objectives are achieved to the extent possible. The observation is noted. The Oak Ridges Moraine is to the north of the study area. However, a note has been added to Section 4.2.1 recognizing the importance of the Oak Ridges Moraine to the surface and groundwater systems of the area. MTO uses this manual as one of several technical references in carrying out stormwater analyses. MTO has been implementing stormwater management on its projects for many years. Implementation is inferred in the existing statements in Chapter 6. Wording to this effect has been added to Chapters 4&6 and Table 6.6.1. Map of groundwater resources has been added as Exhibit 4.2.3. Well records and locations were identified during the Route Planning Study, and will be reconfirmed at the design stage. Mitigating measures have been added to Table 6.6.1. The extent of the hydrogeological work that has been done for this study is referenced in the EA. Additional work may be done during the design phase. If so it will be reviewed with stakeholders.

MOEE COMMENTS	MTO RESPONSE
<p>6- The noise report prepared during Route Planning was never circulated to our Noise Unit nor was it included in the EA.</p> <p>CHAPTER 5</p> <p>1- MOEE asks for clarification of Table 5.2.2.</p> <p>2- The section on Natural Environment on p.5-48 should be expanded to include groundwater.</p> <p>3- Other than some "sketchy" information contained in Exhibits 5.5.2 to 5.5.8, the draft EA does not indicate the ranking of the alternative routes from the noise aspect or for that matter any environmental aspect.</p> <p>- Noise is missing from Table 5.6.7</p> <p>CHAPTER 6</p> <p>1- Given that there will be some "displacement" of existing residences... it should be noted... that any existing wells...and septic systems and tile beds...will need to be properly abandoned/decommissioned.</p> <p>2 - a) Reference should be made to the MOEE publication entitled "Stormwater Management Practices Planning and Design Manual", June 1994.</p>	<ul style="list-style-type: none"> A noise study was carried out as part of the Route Planning study, and the results are presented in Chapter 4 and Appendices 9-15. A detailed noise study of the technically preferred route will be carried out at the design stage in consultation with MOEE. There is no Table 5.2.2 in the Draft EA. Groundwater impacts was not a key consideration in the analysis of extension staging options because the impacts of the ultimate facility would eventually be realized and therefore are not relevant to the decisions regarding staging. Appendices 9 to 15 provide detailed information on the specific impacts (including noise) of each of the paired comparison alternatives. Noise was not a determining factor in the analysis of the extension alternatives and therefore was not included on Table 5.6.7. The importance of proper abandonment of wells and septic systems has been recognized in Chapters 4 and 6 and has been added to Table 6.6.1. MTO uses this manual as one of several technical references in carrying out stormwater analyses

MOEE COMMENTS	MTO RESPONSE
<p>b) "will strive" in second bullet on p. 6-30 is weak and potentially contentious...</p> <p>c) the third bullet point: the use of words "consideration will be given" leaves some doubt as to whether potential adverse environmental impacts will truly be addressed and prevented as part of the undertaking.</p> <p>d) what are alternatives to discharging bridge runoff to ponds or swales?</p> <p>3- Erosion and Sedimentation</p> <p>a)p. 6-30 add the following wording "investigate the potential for destabilization... develop mitigation strategies... implement approved mitigation strategies through design and construction documents".</p> <p>b) Add impacts to wells, abandonment of wells and impact on aquifer recharge areas to Table 6.6.1.</p> <p>4- Noise</p> <p>a) This section should contain at least a preliminary indication of the potential noise impacts associated with the technically preferred route. In addition, a brief description should be given of the potential for mitigation at these homes along with the anticipated acoustical effectiveness of the measures which will be applied.</p>	<ul style="list-style-type: none"> • It may not always be possible to achieve the detention time specified, however it is MTO's objective to strive for this level of protection. This will be subject to discussion during the Stakeholder Consultation Process. • MTO has committed to addressing adverse environmental impacts of stormwater through the development of a Stormwater Management Plan in consultation with Stakeholders (see Chapter 6). • It may not always be possible to take bridge runoff to the shore and a direct discharge to the watercourse may be necessary. However, this would only be done where there is no other reasonable alternative. • Wording to this effect has been added to Chapter 6. • Added to Table 6.6.1. • Appendices 9-15 provide information on the homes affected by the alternatives. The detailed noise study carried out at the time of design will identify the specific impacts, mitigating measures and the effectiveness of these measures. A note on typical mitigating measures has been added to Chapter 6.

MOEE COMMENTS	MTO RESPONSE
<ul style="list-style-type: none"> • b) A brief description should be given of the increases in traffic noise levels which could occur along the roads in the immediate vicinity of the proposed extension... and the measures which will be considered to mitigate these impacts. • APPENDIX 7 <ul style="list-style-type: none"> - On p.2 each factor... was given a "weight". However, the actual "weight" ... was never specified. • APPENDIX 22 	<ul style="list-style-type: none"> • The noise analysis addresses the noise implications of the undertaking. The noise implications of traffic on other roadways is not analyzed. • Exhibit A7-1 showing the relative weighting has been provided in the Appendix. • Following clarification discussions with the MOEE Noise Assessment staff, the Appendix has been modified to be consistent with the MOEE/MTO Noise Protocol.

MNR COMMENTS	MTO RESPONSE
<p>Stormwater Management</p> <ul style="list-style-type: none"> • All watercourses in Rouge watershed should be considered ... for Level 1 protection. <p>Bridges and Other Watercourse Crossings</p> <ul style="list-style-type: none"> • The main Rouge River and Little Rouge River are considered significant riverine corridors. MNR requests the maximization of the span width ideally from top-of-bank to top-of-bank. <p>Fish Habitat</p> <ul style="list-style-type: none"> • Fisheries Act Authorization/compensation will be required. • ... inconsistency in stream classifications should be recognized in the subsequent project planning stages. • Fisheries habitat downstream of the Highway 407 ROW must be included in the review when determining the protection level criteria for stormwater. • pg 1-3 MNR concurs with the idea of a Stakeholder Consultation process (SCP) as a condition of approval for a fast tracking the EA. • pg 1-4 Chapter 5 ... should be revised to accommodate any new comments if received. 	<ul style="list-style-type: none"> • Level 1 protection will be considered for all watercourses in the Rouge watershed as part of the Stakeholder Consultation Process. It may not always be possible to achieve this level of protection. • MTO has acknowledged the sensitivity of the corridors with respect to terrestrial and aquatic habitats being crossed and has committed to working with the stakeholders during design to protect these corridors. Until some design work has been completed it is premature to state what span width will be possible. • The need for Fisheries Act authorization and compensation will be determined at the design stage when the method of stream crossings has been determined in consultation with stakeholders. • MTO recognizes that there are some inconsistencies between the earlier fisheries work and the latest information. This does not affect the planning decisions however will be reviewed with the Stakeholders during the design process to ensure that mitigating measures are appropriate to the stream characteristics. • This has been agreed to and is reflected in the Stakeholder Consultation Process. • Noted. • The EA has been revised to address the comments received on the Draft EA. This appendix presents a highlighting of the comments and MTO's response, and the specific responses received on the Draft EA.

MNR COMMENTS	MTO RESPONSE
<ul style="list-style-type: none"> pg 1-5 When determining stormwater requirements, and addressing environmental concerns, will MTO/OTCC accommodate concerns for initial lane construction, i.e. 4 lanes, 10 lanes, and/or include the proposed transitway? pg 1-9 Monitoring should be discussed with other agencies in the SCP. pg 1-22 Please add a statement "that although many issues have been resolved, issues relating to structure selection and design will receive discussion and be resolved through review agency and stakeholder participation using the SCP". Table 3.2.2 <ul style="list-style-type: none"> Safety: ... pedestrian walkways / hiking trails under bridge structures should be considered. Exhibit 4.2.1 <ul style="list-style-type: none"> Rouge River and Little Rouge River, West Duffins, and Duffins are managed as Coldwater. Migratory fish are known to travel past the ROW on the Little Rouge Creek. In 1996 the Salmonid Ecology Unit captured redside dace downstream of the confluence of Ganetskiagon and its tributaries, south of Concession Road 5. pg 4-6 Please consult with MTRC and MOEE to determine if any new studies have been prepared regarding ground water in the Highway 407 study area. pg 4-7 Please add: Groundwater / springs exist in the vicinity of AL1380 to the east of Brougham. 	<ul style="list-style-type: none"> Mitigating measures will be developed on the basis of the ultimate facility including the Transitway. However, the implementation may be phased consistent with the phasing of the construction. MTO has committed in the SCP to working with stakeholders to determine the need for monitoring. This is reflected in Chapters 1 and 6. A statement to this effect has been added to Chapter 1.. This concern has been reflected in the Stakeholder Consultation Process and Chapter 6. A note has been added to Exhibits 4.2.1 and 4.2.4 indicating that these watercourses are managed as coldwater. This has also been reflected in the text of Chapter 4. Reflected in revisions to the text. Reflected in revisions to the text. New information will be considered during the Stakeholder Consultation Process (See Chapter 6). Words to this effect have been added to Chapter 4.

MNR COMMENTS	MTO RESPONSE
<ul style="list-style-type: none"> Exhibit 4.2.3 <ul style="list-style-type: none"> Rouge River and Little Rouge River are managed for coldwater, coldwater migratory, and warmwater fish species. pg 4-11 There are no dams downstream of the ROW that prevent coldwater salmonids access to the study area. pg 4-12 The Ministry has sampled salmonid species both above and below the Highway 407 crossing of West Duffins Creek pg 4-13 <ul style="list-style-type: none"> Reesor Creek contains brook trout and MNR manage waters upstream of the Whitevale Dam for brook trout. As recent as 1991 rainbow trout and mottled sculpin were captured between Concessions 4 and 5. Any stormwater inputs upstream must take into account increases in temperature to the watercourse. pg 4-16 Note the significance of these wetlands. pg 4-17 Note that larger mammals such as deer move through open areas at night. pg 4-22 Stress that watercourse quality is the product of upstream tributaries and their combined qualities. pg 4-23 Spring Creek provides fish habitat on a seasonal basis. pg 4-34 What will be the impacts on the Pickering Rod and Gun Club? pg 4-50 What percentage of wetland areas were groundtruthed? 	<ul style="list-style-type: none"> A note has been added to Exhibits 4.2.1 and 4.2.4, and Chapter 4 indicating that these watercourses are managed as coldwater. The text of Chapter 4 has been changed to address this comment. The text of Chapter 4 has been changed to address this comment. The text of Chapter 4 has been changed to address this comment. The text of Chapter 4 has been changed to address this comment. Temperature implications will be one of the considerations during the design of Stormwater Management facilities (see Chapter 6). The significance of the wetlands was recognized in the planning process by establishing them as constraints when identifying route alternatives. Wording regarding the use of fragmented landscapes by some wildlife species has been added to Chapter 4. The text of Chapter 4 has been changed to reflect this comment. This has been noted and will be a consideration during design and the Stakeholder Consultation Process. The tenancy for the Pickering Rod and Gun Club will be addressed in accordance with the lease provisions - See Table 6.6.1. The wetlands affected by the technically preferred route were groundtruthed as part of the 1995 Terrestrial Study.

MNR COMMENTS	MTO RESPONSE
<ul style="list-style-type: none"> • Table 4.8.1 <ul style="list-style-type: none"> - for Hydrogeology, under Concerned Agency and Group, please add MNR. • Table 4.8.1 <ul style="list-style-type: none"> - is erosion of the eastern bluff still a concern, upstream of the Highway 407 crossing of the Rouge River? • pg 5.5.3 Please explain the statement: "Greater number of impacts in Rouge River watershed are related to influence on Petticoat Creek headwater area. • Exhibit 5.5.4 <ul style="list-style-type: none"> - For South of Brougham please eliminate the work "marginally" from marginally less desirable. • pg 5-42 Natural Environment - please remove "staging" and replace with "timing". • pg 6-1 Please insert "a guarantee for a minimum of " 6 bridged watercourse crossings. • 6.2.4 and 6.2.3 plate 3 <ul style="list-style-type: none"> - Are there any environmental implications relating to the realignment of Highway 7? 	<ul style="list-style-type: none"> • MNR added as a Concerned Agency. • Reference to the Rouge River added to the Geotechnical section of Table 4.8.1. The stability of the banks and necessary remediation will be reviewed in more detail at the design phase. • Because the potential effects on the headwaters of the Petticoat Creek are greater for the southern alternative than for the northern alternative, the northern alternative was preferred for this factor. This has been added to the text in Chapter 5. • This was the judgement of the project team doing the evaluation at the time and therefore we have not changed the wording. • It is staging that is discussed in this Chapter, not timing. Therefore the wording has not been changed. • MTO has already committed in several places in the EA to provide bridges at specific crossings. These were developed in discussions with MNR, MTRC, DFO and DOE. Therefore the wording has not been changed. • The environmental implications of the Hwy 7 relocation has been factored into the analysis. The text in Chapters 5 and 6 has been modified to clarify this fact.

MNR COMMENTS	MTO RESPONSE
<ul style="list-style-type: none"> • Table 6.4.1 - A statement should be included suggesting “crossing type as proposed by MTO / subject to review / clarification by participating agencies and SCP”. - This table does not presently take into account system function. • pg 6-27 Note that the Central Stoneroller has been captured downstream of the crossing of the Rouge River. • pg 6-27 MTO did not sample every crossing. • pg 6-28 First paragraph ... “if a new crossing is required” should be deleted. • pg 6-28 Placement of piers in the bankfull channel will be discouraged by MNR. • pg 6-30 Please add “the contractor shall be responsible for addressing impacts of construction on shallow groundwater and its dependent fisheries”. • pg 6-31 Please eliminate ... “sometimes” from sometimes allow for the passage of animals. • Table 6.6.1 - Upstream Flood Levels - please change to: “A drainage analysis will be carried out to assure that <u>crossings</u> are designed to minimize erosion and flood risk”. - Groundwater Upwelling Areas - change to “Open bottom culverts / <u>bridges</u> will be required in upwelling areas”. 	<ul style="list-style-type: none"> • The Stakeholder Consultation Process states that the crossing types will be developed in consultation with stakeholders. Reference to culverts has been removed from Table 6.4.1. • Table 6.4.1 does include the system function. • The text has been revised to reflect this comment. • MTO sampled every crossing and provided collection permit records to MNR on September 16, 1996. • The bridge at AL 1780 will only be required if the design of the connection to Highway 7 requires a crossing of the watercourse. Therefore the statement as written is correct. • The undesirability of placing piers in the bankfull channel is recognized in the EA (Chapter 6) and would only be considered if there was no reasonable alternative. This will be discussed during the SCP. • Wording has been changed in Chapter 6 to indicate that the designer and contractor will be responsible for addressing impacts to shallow groundwater resulting from construction. • Vegetated corridors do not always allow for animal passage. Therefore the wording is correct as written. • Change has been made to Table 6.6.1. • Wording in Table 6.6.1 has been changed to “Open bottomed culverts/bridges will be considered in upwelling areas”.

MNR COMMENTS	MTO RESPONSE
<ul style="list-style-type: none"> - Rouge River / Little Rouge Creek, and Petticoat Creek will require water quality and quantity control that addresses Level 1 criteria and erosion control to 2 year (25 mm / first flush). - Rouge River AL1794 provides aquatic function but no direct habitat. - AL1780, AL1760, AL1720 and AL1719 are considered to be fisheries habitat. - MNR has provided additional information on several watercourses. - AL1470 terrestrial units provide a wide corridor, a diversity of values and exhibit high contiguous value through riparian connection. - Table 6.6.1 should reflect the above terrestrial values, and state that corridor values will be reviewed with agencies / stakeholders in the SCP. • Appendix 16 - As the revised MTO Fisheries report does not reflect MNR's site specific comments, the fisheries document is accepted on the condition that MTO acknowledges that it is aware that MNR will be using system function as a criteria for stormwater management and impact to fisheries. - MNR's correspondence and comments have not been incorporated into the EA Report. - This Ministry is satisfied that the S3S alternative as presented is the most suitable option. 	<ul style="list-style-type: none"> • The sensitivities of these watershed have been recognized in the EA. The location for Level 1 protection will be determined during the Stakeholder Consultation Process. • This is noted and will be considered further at the design stage as part of the Stakeholder Consultation Process. • MTO's field work indicates that these watercourse provides aquatic function but no direct habitat. Any additional data will be considered during the Stakeholder Consultation Process. • This information is noted and will be part of the additional information that will be considered at the design phase as part of the Stakeholder Consultation Process. • Table has been revised to acknowledge MNR's comment on corridor value. • Table 6.6.1 revised accordingly. • It is clear that MNR's position during the SCP will be that system function will be a criterion for stormwater management and impact to fisheries. • MNR's comments have been reflected throughout the report. MNR's correspondence and comments were not included in Appendices 16 and 17 of the Draft EA because of ongoing discussions at the time of printing. They have been included in the final EA. • Noted.

MNR COMMENTS	MTO RESPONSE
<ul style="list-style-type: none"> Appendix 19.1 A passage indicating Appendix 19.1 is unrevised and that the SCP will take into account concerns / information from commenting agencies during the SCP should be included. Table 5.3 The summary of Fish and Aquatic Habitat Findings appears to be incomplete / simplistic for Comments on Special Features / Sensitivities. Sensitivities will be more evident during design selection and input by review agencies during the SCP. Appendix 21 As per MNR's December 12/96 letter the need for addressing wildlife corridor values is mentioned in the EAR (pg 6-32) but is not detailed in the SCP. 	<ul style="list-style-type: none"> A note to this effect has been added to the "Notes to Reader" in Appendices 19.1 and 20. The need for additional fisheries information was recognized and resulted in the additional field work and preparation of the 1996 Fisheries Inventory Study by MTO (Appendix 19.2). The SCP commits to including wildlife corridor values as one of the considerations to be reviewed at the time of crossing design as part of the Stakeholder Consultation Process (Chapter 6).

MTRC / ROUGE PARK ALLIANCE COMMENTS	MTO RESPONSE
<ul style="list-style-type: none"> This report should confirm that new information will form part of the analysis / evaluation of design options through the SCP. Re: the proposed SCP, comments that were provided on the draft in the fall of 1996 have not been fully addressed. Municipal staff should form part of the SCP. Table 6.3.1 - column for "Other Environmental Considerations" does not provide enough information on the scope and scale of these considerations. 	<ul style="list-style-type: none"> Wording to this effect has been added to Chapter 6. As mentioned in the December 10/96 letter to MTRC, some of the comments on the SCP were received too late to be included in the Draft EA, however the changes would be reflected in the final EA. These changes have been made to Chapter 6. This was the intent. Chapter 6 has been clarified. The text has been clarified to confirm that broad range of factors included under the heading "Other Environmental Considerations". A note has also been added to Table 6.3.1.

MTRC / ROUGE PARK ALLIANCE COMMENTS	MTO RESPONSE
<ul style="list-style-type: none"> • The column in Table 6.6.1 that suggests culverts for some crossings is premature and the report should just indicate that at this time we know that there will be spans required at six crossings and the remainder will be determined through the SCP. • We would suggest that the issue of monitoring be defined through the SCP. • Section 6.3.4, page 6-12 - are construction plans to be forwarded for review and comment / approval, or for information purposes? • Follow-up (page 6-36) - first bullet point - expanded to include a reference to commitments to an environmental site inspector at crossings. • Page 1-22 should be revised to include further Rouge Park Alliance resolutions made at the December 11, 1996 meeting. • Section 2.4, page 2-29 - the direction that there be no new roadway crossings within the Rouge Park should also be reflected as a position affecting the roadway usage. • The section on crossing of the CPR and the Little Rouge (section 6.3.5, page 6-13)... should be clarified to reflect that the separation of these crossings deals only with approval related to grade separation from the Canadian Transportation Agency. • The design selected for the highway crossing must be made in light of any future requirements for the transitway such as stormwater or access which may affect property requirements or alignment and the resources therein. 	<ul style="list-style-type: none"> • Reference to culverts has been removed from Tables 6.4.1. Clarification of this principle has been added to preamble to Table 6.6.1. • It was always the intent that the need for, and nature of monitoring would be defined through the SCP. This has been clarified in Chapters 1 and 6. • Construction plans will be made available to stakeholders for review and comment (see Chapter 6). • The bullet has been expanded to ensure that clear responsibility for environmental inspection is assigned (see Chapter 6). • Resolution has been added to EA (see Chapter 1). Although each stakeholder group is requested to identify a representative that can speak for the organization at Stakeholder meetings, this does not preclude individual meetings with other representatives to address specific issues. • This issue has been recognized in Section 2.2.1.2 of the EA. • This clarification has been made in Chapter 6. • The requirements of the ultimate facility will be considered when developing mitigating measures and property requirements.

MINISTRY OF CITIZENSHIP, CULTURE AND RECREATION COMMENTS

MTO RESPONSE

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| <ul style="list-style-type: none"> • We are pleased that archaeological assessment is taking place early in the planning and design process. For any archaeological site that is documented, this Ministry encourages all reasonable efforts to be made to avoid and preserve the site. • Built heritage resources are likewise best conserved within their original context. The moving of a significant built heritage feature should be avoided if at all possible. • The outstanding concerns of this Ministry in respect to Highway 407 primarily relate to cultural heritage landscapes, and what can be done to address the impacts on those landscapes. If cultural heritage landscapes are to be conserved, it is critical for design and construction to place as much emphasis as is realistically possible on minimizing negative impacts and integrating the highway into the existing fabric of cultural heritage landscapes. • Interchanges will be one of the most overwhelming impacts to cultural heritage landscapes. While it is recognized that there is little flexibility in interchange location, consideration should be given to such factors as interchange shape and design in mitigating the impacts of interchanges on cultural heritage landscapes. • Built heritage resources are one of the more important components of the landscape and we ask that the conservation of significant heritage buildings be an integral part of conservation of significant cultural heritage landscapes. • We ask that MTO consider the potential for any landscape impacts which might occur to communities in the area of the ROW. The impacts to Brougham would appear to be the greatest, in terms of the removal of buildings, traffic flow, and the close proximity of the interchange. Mitigative measures are especially encouraged for this community. We also ask that should the local municipality decide to build a Broek Road by-pass, that MTO consider co-ordinating their mitigation strategies with such plans. | <ul style="list-style-type: none"> • Archaeological studies are underway, and where possible the alignment will be refined to avoid and preserve sites. However, salvage may be the only mitigation alternative for some sites. • MTO agrees that it is preferable to preserve heritage resources where possible. • During the design phase, opportunities for reducing impacts to the cultural landscape will be reviewed. MCzCR and the LACAC will have the opportunity to participate as part of the Stakeholder Consultation Process. • During the design of the interchanges, opportunities for reducing environmental impacts, including impacts to cultural heritage will be considered. • During the design phase, a detailed review of significant heritage buildings potentially affected by the undertaking will be carried out in consultation with MCzCR and the LACAC. The goal is to minimize effects to heritage buildings where possible. Where avoidance is not possible mitigation strategies will be developed. • Potential impacts to the local communities have been a key consideration throughout this study and will continue to be a key consideration during the design phase. Minimization of the potential impacts to the Hamlet of Brougham was key to the decision to extend the Highway 407/Transitway to connect to Highway 7 east of Brougham. At the time of design, further opportunities for reducing the impacts will be considered. This will include coordinating with municipal initiatives where construction timing permits. |
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NORTH PICKERING DEVELOPMENT CORPORATION COMMENTS	MTO RESPONSE
<ul style="list-style-type: none"> • Revise the assumption in the report about the projected population for Seaton within the time frames under consideration. • The description of Seaton on page 4-41 contains some inaccurate information. (Proposed revision provided.) • Table 3.2.2 in Chapter 3 - does not address the potential impact of the intended interchanges. • Review Table 2.2.2 on page 2-13 since it appears that the figures for person travel and vehicle travel in the category Auto Trips should be reversed. 	<ul style="list-style-type: none"> • The assumptions have been revised. These changes have no significant effect on the traffic projections. • Changes to Chapter 4 have been made. • The interchange locations will be determined as part of the North Pickering Development plan. The effects will need to be reviewed at the time they are proposed. • Table 2.2.2 has been reviewed and corrected.

ENVIRONMENT CANADA	MTO RESPONSE
<p>Water Quality</p> <ul style="list-style-type: none"> • With respect to water quality issues, we do not have any major concerns as the EA Report adequately considers the issues raised previously by our department. We expect to have the opportunity to comment on specific details of the project when federal EA approvals are being sought. • Chapter 4 - Table 4.8.1 <ul style="list-style-type: none"> - "DOE - Environment Canada" was not included in the list of abbreviations. - Fisheries (p. 1) - DOE should also be included as a "Concerned Agency" in regard to deleterious substances. - Ecosystem Integrity (p. 2) - DOE should also be included as a "Concerned Agency". - Additional bullet items should be included to consider cumulative impacts. • Chapter 6 <ul style="list-style-type: none"> - Pg 6-32 - include provision to use native species. - Pg 6-37 - last bullet, "If a monitoring plan is needed, a plan will be developed and implemented as appropriate". - Table 6.6.1 - suggest that DOE be included as a Concerned Agency in all cases when potential environmental effects on Water quality (impacting fish habitat) are identified, such as stormwater runoff, erosion and sedimentation. • Provide Volume 2 of the Fenco MacLaren Detailed Aquatic and Terrestrial Biological Study. • Conduct additional vegetation surveys in specific vegetation units if there are data gaps that suggest significant plant species may have been missed. 	<ul style="list-style-type: none"> • Noted. • DOE - Environment Canada has been added. • DOE has been added as a Concerned Agency. • DOE has been added as a Concerned Agency. • Cumulative effects will be further addressed as part of the CEAA applications. • Wording to this effect has been added to Chapter 6. • Wording to this effect has been added to Chapter 6. • DOE has been added as a Concerned Agency. • The relevant components of Volume 2 have been provided to DOE and will be made available to other agencies upon request. • Field work was done as part of the 95/96 studies. No additional field work is planned, however if additional data is made available, it will be considered at the design stage as part of the Stakeholder Consultation Process.

ENVIRONMENT CANADA	MTO RESPONSE
<ul style="list-style-type: none"> • If significant plant species are found, transplant specimens to a safe area outside of the ROW. • Take advantage of any opportunities to retain exceptional tree specimens, by altering the line of clearing at the edge of the ROW, if at all possible. • All topsoil disturbed on the ROW should be used for 407 corridor rehabilitation. • Native species of trees, shrubs, <u>grasses</u> and forbs should be used to the maximum extent possible in site rehabilitation. 	<ul style="list-style-type: none"> • The need and feasibility of transplanting significant species within the Right-of-Way will be considered during the SCP. It may not be possible to avoid stockpiling topsoil higher than 1 metre. • As committed to in the SCP (Chapter 6) opportunities for reducing vegetative impacts through minor adjustments at the design stage will be considered. • Topsoil is a resource that will be used on the Hwy 407 project to the extent possible. • When developing planting programs, the use of native species will be considered (see Chapter 6).

FISHERIES AND OCEANS COMMENTS	MTO RESPONSE
<p>Fisheries and Habitat Management (DFO-FHM)</p> <ul style="list-style-type: none"> • The procedures outlined in this report should adequately involve DFO-FHM in the review of the proposed work, where appropriate, and should address concerns that DFO-FHM may have regarding this proposal. • Please note that the assessment under CEAA must consider any cumulative environmental effects. • Additional information, beyond that presented for water crossings, may be required to determine the potential impacts that may result. • For each watercourse crossing, evaluations are made for type and significance of the fishery, significance of vegetation and wildlife, and corridor value. What criteria was used to make these evaluations? Are the stream classifications presented similar to those of OMNR? Are there any coolwater systems within this section? • Where authorization under the <i>Fisheries Act</i> is issued, a Monitoring Plan must be developed. Appendix 16, page 17 of 24, states that there is "non-acceptance of monitoring requirements". Please explain this statement. • Phrases such as "where warranted", "where practical and feasible", "where site conditions permit", "where possible", etc. These are vague terms and may leave the impression that environmental considerations may not be dealt with in an appropriate and adequate manner. 	<ul style="list-style-type: none"> • Noted. • This is understood and has been acknowledged in Chapter 6 of the EA. • Additional information will be considered at the design stage as part of the SCP. • The criteria used for determining significance is consistent with MNR's criteria. Significance information will be reviewed as part of the SCP during the design phase. • The need for a monitoring plan as part of a <i>Fisheries Act</i> authorization is understood. The wording of Appendix 16 has been clarified. • MTO is committed to addressing environmental effects. The SCP was specifically developed to ensure that stakeholders are involved in the design and construction phase to ensure that mitigating measures are developed with stakeholder input. However, it must be recognized that there may be physical constraints that do not permit implementation of some mitigating techniques.

FISHERIES AND OCEANS COMMENTS	MTO RESPONSE
<p>Canadian Coast Guard</p> <ul style="list-style-type: none"> As the Canadian Coast Guard is a member of your external team for the Rouge River Bridge crossing and with the commitments noted ... in the Draft ESR, I believe concerns related to our Federal Authority have been identified and will be adequately addressed during the design stage to follow. 	<ul style="list-style-type: none"> Noted

Note: The Canadian Transportation Agency also provided advice on compliance with the Canadian Transportation Act and expressed not concerns with the Draft EA.

Ministry of
Agriculture
and Food

Ministère de
l'Agriculture et
de l'Alimentation

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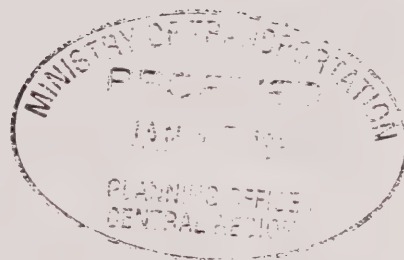
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January 14, 1997

Paul Jankowski
Project Director
Ministry of Transportation
Planning Office - Central Region
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M3M 1J8



Dear Sir/Madame:

RE: Highway 407/Transitway - Markham Road Easterly to Highway 7
East of Brock Road - Pre-submission Review
Durham & York Regions

Staff of this Ministry have completed a review of the above-noted report. Consideration has been given to the matter in terms of the goals, objectives, policies and programmes of this Ministry. The following comments are provided.

Based on present knowledge and a staff review, this Ministry has no concerns.

Should you have any questions or wish to discuss this matter further, please contact this office.

Yours truly,




Ray Valaitis
Rural Planner

copy: Donna Sharp Mundie, Land Use Consultant, OMAFRA

(rcv)

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28 January 1997

Paul Jankowski 
Project Director
Highway 407 East
Planning Office
Central Region
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Downsview ON M3M 1J8



RE: Draft Environmental Assessment, Proposed Highway 407 from Highway 48 to Brock Road, Town of Markham, Regional Municipality of York, and Town of Pickering, Regional Municipality of Durham

We appreciate the opportunity to review the draft environmental assessment report and the extensive documentation that has been provided. This office will also be reviewing future reports and providing additional comments on cultural heritage resources associated with this project.

This letter constitutes our presubmission comments on the EA. Some of our concerns have been reduced by recently provided information. However, we do have continuing concerns about impacts to cultural heritage resources by Highway 407. Given that the preferred right-of-way has been selected with regard to an extensive range of criteria, and that the location of many of the major structures (e.g. interchanges and bridges) has been predetermined by the location of the existing infrastructure and existing Official Plan designations, our comments will focus on the design and construction phases of the project and the resources that will be impacted as the project progresses.

We are pleased that archaeological assessment is taking place early in the planning and design process. This will allow for flexibility in the management of the archaeological resources that are documented by the assessment. For any archaeological site that is documented, this Ministry encourages all reasonable efforts to be made to avoid and preserve the site. Excavation,

documentation and removal is not the optimum solution for the resource, and avoidance options should always be considered where possible.

Built heritage resources are likewise best conserved within their original context. The moving of a significant built heritage feature should be avoided if at all possible. The significance and value of any built heritage feature is reduced by the loss of its context.

The outstanding concerns of this Ministry in respect to Highway 407 primarily relate to cultural heritage landscapes, and what can be done to address the impacts on those landscapes. The highway will constitute a dominant feature of the landscape. If cultural heritage landscapes are to be conserved, it is critical for design and construction to place as much emphasis as is realistically possible on minimising negative impacts and integrating the highway into the existing fabric of cultural heritage landscapes.

Separation of the study area into defined landscape units would be a very useful means for managing the impacts on cultural heritage landscapes. Each landscape should be evaluated separately for its significance as a whole, and in terms of its component features. For those cultural heritage landscapes evaluated as significant, conservation measures can then be determined in terms of the overall conservation of the value of the landscape, and in terms of conserving the individual components that are most critical in their contribution to the significance of the landscape.

Interchanges will be one of the most overwhelming impacts to cultural heritage landscapes. While it is recognised that there is little flexibility in interchange location, consideration should be given to such factors as interchange shape and design in mitigating the impacts of interchanges on cultural heritage landscapes. For example, one approach may be to attempt to match landscape patterns inside and outside the interchanges, as well as inside and outside the ROW.

Built heritage resources are one of the more important components of the landscape and we ask that the conservation of significant heritage buildings be an integral part of conservation of significant cultural heritage landscapes. The heritage values of some buildings may be upgraded if they are considered in terms of their contribution to the landscape. This may influence decisions concerning conservation measures. Some buildings, for example, which may have to be relocated could be kept in relatively the same area (if possible) so as to assist in maintaining the appearance and consequent significance of the landscape.

Highway 7 could be regarded as part of several cultural heritage landscapes or as a cultural heritage landscape in its own right. Section 4.6.2 (p. 4-45) of the EAR identifies Highway 7 as an

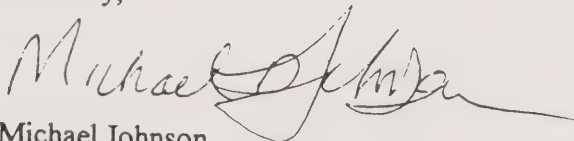
important historical route. Consideration should be given to the value of all or parts of Highway 7 as a cultural heritage landscape and to the most appropriate means for mitigating any impacts from 407. We note that it is possible that a decrease in traffic flow on parts of Highway 7 could occur, which would be beneficial to the landscape.

We ask that MTO consider the potential for any landscape impacts which might occur to communities in the area of the ROW. The impacts to Brougham would appear to be the greatest, in terms of the removal of buildings, traffic flow, and the close proximity of the interchange. Mitigative measures are especially encouraged for this community. Such measures could include: minor alterations in the location of the interchange or the inclusion of mitigating features in the design of the interchange. We also ask that, should the local municipality decide to build a Brock Road by-pass, that MTO consider coordinating their mitigation strategy with such plans.

The most effective means of mitigating impacts to cultural heritage landscapes would be to have the close involvement of a heritage consultant in all phases of design and construction. This consultant should have demonstrated experience and expertise in the documentation, evaluation, and mitigation of impacts to cultural heritage landscapes. As a first step, this consultant, in consultation with both this Ministry and the management team for Highway 407, should identify and document all cultural heritage landscapes to be potentially impacted.

Should you wish to discuss this matter further, please do not hesitate to contact me.

Sincerely,



Michael Johnson
Manager,
Archaeology and
Heritage Planning.

- c. Bob Hodgins, Ecoplans Limited, Manager, Mississauga Office, 2655 North Sheridan Way,
Mississauga ON L5K 2P8
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ENVIRONMENTAL PLANNING AND ANALYSIS BRANCH

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January 23, 1997

MEMORANDUM

To: Fred Leech, Head
Environmental Section
Ministry of Transportation

From: Jim Clifford, Manager
Environmental Planning

RE: **HIGHWAY 407/TRANSITWAY DRAFT ENVIRONMENTAL
ASSESSMENT - MARKHAM ROAD TO HIGHWAY 7 EAST OF
BROCK ROAD**

We have completed our review of the above noted document and provide the following comments. The review is based on the requirements of the Environmental Protection Act, the Ontario Water Resources Act, the Pesticides Act, the Ministry of Energy Act, and associated policy and program areas. This Ministry's technical areas of responsibility include air quality, groundwater effects, surface water effects, waste management/disposal issues, noise, land use compatibility issues, pesticides use and this Ministry's energy policies. The Central Region Office, the Ecosystem Science Section and the Noise Assessment Unit have provided extensive input on this proposal. We provide the following comments.



GENERAL COMMENTS

ECOSYSTEMS

1. This Ministry is encouraging proponents to incorporate ecosystem principles in their EA/Class EA Planning processes. Ecosystem principles should be used in evaluating cause and effect relationships between the proposed undertaking and the biophysical environment. Environmental assessments should recognize the structural and functional relationships among air, land and water. Ecosystem principles can assist proponents in their selection of mitigation measures and in the determination of advantages and disadvantages to the biophysical environment.

This Ministry, in cooperation with the Ministry of Natural Resources, is working with MTO on determining how ecosystem principles can best be incorporated into the planning, design, construction and operation phases of MTO projects. The working group is considering the use of guidelines, policy, protocols and pilot projects as potential implementation mechanisms. The working group will be preparing a document with recommendations on these matters. A draft of this document will be available in early 1997. However, in the absence of formal recommendations, MTO is encouraged to include information on data analysis and/or future commitments/activities which are consistent with ecosystem principles in EA documents. For example, existing sub/watershed studies may be used by MTO as background information in the preparation of an EA; a sub/watershed study can help the proponent establish the environmental objectives for the project; or the EA may include an evaluation of the interrelationships/linkages between the land use impacts of the undertaking and the effects on water quality. Where MTO is undertaking planning activities consistent with an ecosystem principles, MTO should communicate this information in the EA submission.

MTO has stated that significant woodlots and wetlands will be avoided. In addition, on page 4-23, MTO has identified that ecosystem principles are to be considered when assessing impacts and alternatives routes as well as looking at functional relationships between groundwater and fish habitat when looking at stormwater. Recognition of these as important considerations are consistent with moving towards an ecosystem approach in decision making. **There are numerous studies and watershed/subwatershed reports for both the Rouge and Duffins watersheds which are not reflected in the EA documentation for this proposal. Where such information is available, you should be linking your activities to the watershed reports and their recommendations, and this information should be incorporated into the EA evaluation and documentation.**

EA PROCESS

1. MTO is proposing a stakeholder consultation program for the design and construction phases. The stakeholder process is outlined in Appendix 21. This consultation will include technical contacts from MOEE, MNR, municipalities, other agencies and the public. Staff do not object to the approach, however, it is unclear when stakeholders will be contacted, how much time will be allocated for review and input, and how the input will be used by the proponent. **The final EA should clarify these details.** These are important details which are vital for appropriate staff allocation.

WATER QUALITY, QUANTITY, MITIGATION AND MONITORING

1. Although the draft EA does recognize water quality as an issue particularly for fisheries habitat, staff are not satisfied that the draft EA includes adequate information on both the quality and quantity of ground water and surface water resources and on potential for avoiding adverse effects in the impact area(s). This undertaking will have to be managed to prevent stormwater and erosion impacts on both surface water and ground water resources during construction and operation of the facility. **Staff have made a number of specific recommendations to deal with this issue in the specific comments on the various sections of the draft EA.**

NOISE

1. In general, staff are not satisfied with the level of information provided on noise and its impacts in the Draft EA. Earlier documentation from the proponent referenced a noise study which has not been included in the draft EA. **Staff have made a number of specific recommendations on noise issues in the specific comments on the various sections of the draft EA. Given the time constraints, staff of the Noise Unit have recommended that a meeting between technical noise staff of the MTO and MOEE should be arranged as soon as possible to ensure that the final EA will contain sufficient information.**
2. In addition, staff have major concerns with Appendix 22. Changes have been made to the MOEE/MTO Noise Protocol with regard to the criteria for considering noise control measures. The revisions appear to (a) minimize the importance of increases in noise levels of greater than 5 dB in areas with low background sound levels and (b) establish an "objective " sound level of 55 dBA instead of the "pre-existing background" sound level as implied in the Protocol.

Section 9 of the Protocol prohibits changes be made to the Protocol without agreement between MTO and MOEE. Therefore, these changes to the criteria are not acceptable and the final EA must be redrafted accordingly.

Please note, staff are not opposed to revisiting the Protocol to update it. However, to avoid unnecessary delays in the approval of this undertaking, we suggest that, as on other highway projects, the discussions between our ministries be conducted outside of the project and that until such time that an agreement is reached, the existing Protocol remain in effect

SPECIFIC COMMENTS ON SECTIONS OF THE DRAFT EA

Chapter 1: Introduction and Background

1. The proposal to terminate the proposed extension of Highway 407 on Highway 7, east of Brock Road, makes sense, as it utilizes an existing east-west highway, rather than ending at a north-south roadway. A north-south roadway represents a barrier or impedance to smooth traffic flow, while the east-west highway permits smoother transition in traffic flow. One of the main environmental benefits of the east-west exit/entry may be a reduction in air impacts, as braking and acceleration will be decreased.
2. In reference to "Mitigation" and to "Design Phase", it would be useful if the proponent were to provide examples of anticipated mitigation measures, and design techniques or practices which would address the types of environmental concerns implicit in the proposal.
3. The EA contemplates the initial construction of 2-3 lanes in each direction, with ultimate growth to 5 lanes in each direction. This approach is acceptable, however, in the final EA, the proponent should be clear that this EA and its related design and construction documents will apply to the complete 10-lane facility. This would ensure that the full impact of the facility is understood at the outset, and that unanticipated concerns/delays with respect to the construction of additional lanes are not experienced at a later date.

Chapter 2: Problem and Opportunities (sections 2.1 and 2.5)

1. The proposal to include a transitway as part of the highway is effective use of a transportation corridor. However, the current EA document notes that the transitway would be subject to an additional EA. The primary concern that arises here is that noise studies done in support of the highway would not necessarily include noise from a busway/light rail transitway. If noise from these sources is not considered in the current EA, the ability to implement the transitway may be compromised in that noise controls may not be achievable as a result of route design configurations and noise control placement, or existing noise controls may need to be augmented at excessive additional costs. During development design, this type of concern should be clearly and carefully assessed.

Chapter 3: Alternatives to the Undertaking

1. On p. 3-3, Table 3.2.1 needs to be expanded to include impacts on surface water and groundwater resources. These "sub-factors" are essential, as impacts on them have a direct effect on their human and non-human users. Although fisheries is included as a sub-factor, the principal component of their habitat (water) should be addressed from a quality and quantity standpoint (our Ministry is responsible for water quality and quantity, while MNR is responsible for the fisheries and habitat changes).

Stream crossings should be also be included as a "sub-factor". This "sub-factor" is important in that many of these streams rise in the Oak Ridges Moraine, and thereby have a significant profile in any land use development proposals.

2. The four bullet points noted on pp.3-20 and 3-21 are central to the entire planning exercise if Hwy. 407 is not to be "outgrown" by the development it is intended to serve (a good example of this situation is travel on Hwy. 404 during rush hours). Mechanisms need to be proposed which can incorporate the content of the third bullet point in Regional and local Official Plans, and subsequently, in land use development documents.
3. The third paragraph on p. 3-20 is unclear in that the last sentence says that "it is recommended that the following long term transportation plan be considered", without saying who should consider it and by what means it should be considered. This point should be clarified so that the preferred alternative is clear, and not unnecessarily complicated by land use planning matters which, although related to the EA, actually fall outside the scope of the EA. The purpose of the EA was to find a route for the extension, and the EA itself should be, in part, the result of consultations with affected Regional municipalities regarding their long term land-use planning.
4. As an observation, alternative uses of existing transportation could prove beneficial in solving some of the highway use/congestion problems. For example, commuter trains not used on weekends and statutory holidays could be used as "vacation trains", with lowered "package" fares as incentives to get people to leave their cars at home. This practice appears to be quite successful in Europe. The benefits are reduction in traffic, reduction in air impacts, generation of revenue from otherwise idle equipment, creation of additional employment, provision of vacation opportunities at locations that might otherwise be inaccessible to people without cars, and generation of additional revenue at destination locations.

Chapter 4: Existing Conditions

1. Section 4.2.1, p. 4-3, notes that the rivers and streams that cross the study area rise in the Oak Ridges Moraine, which is located immediately north of the study area. This section would benefit from inclusion of recognition of the profile given to the Oak Ridges Moraine, particularly with respect to surface water and groundwater. Activities proposed in the watersheds could be seen as potentially compromising both the objectives and the achievements of the Oak Ridges Moraine Guidelines. Water quality and quantity protection and maintenance should therefore be clearly cast in the context of the proposed highway extension and the Oak Ridges Moraine Guidelines.
2. Paragraph 4 on p. 4-7 should make reference to the MOEE publication entitled "Stormwater Management Practices Planning and Design Manual", June 1994. The last sentence in this paragraph should be revised to read "The results and recommendations of the approved stormwater management study are to be implemented as part of the construction and highway maintenance activities." Staff understand that MTO's manual is undergoing significant revision and has not yet been completed. Until the new manual is reviewed and supported by this Ministry, the existing manual should be used.
3. Paragraph 4 on p. 4-7 should include the concern that installation of servicing conduits as part of roadway construction could interfere with groundwater movement. Interference could be significant if it resulted in adverse impacts on wells used to obtain water from shallow groundwater supplies.
4. It would be useful to note in the Significance and Sensitivity section the number and location of water wells both within the proposed right-of-way and within 150 metres of the right-of-way external limits. The geological formations that provide water supplies and the wells established in them should be plotted on the exhibits (maps) included in this Chapter. Mitigation measures may be required to address adverse impacts on water supplies: they should be noted in this Chapter.
5. There is no reference to field work undertaken as part of the hydrogeological evaluation of the study area. Hydrogeological study based on field work is essential to minimising adverse effects on both groundwater and surface water. If field work has been completed, or will be undertaken, it should be referenced/ made available in the final EA.
6. In Section 4.4.4 of the Report (Page 4-36) we note that a noise impact study was prepared by J.E. Coulter and Associates during the Route Planning Stage. The Report was never circulated to our Noise Unit nor was it included in the EA.

The Report is of importance, not only in assessing the relative merits of each route from the noise aspect, but in gaining some insight into the noise impacts from the technically preferred route. Since no preliminary design noise study was performed on this project, the Report is the only document which could provide at least some indication of the noise impacts associated with the preferred route and of the potential for mitigation of these impacts.

5. Chapter 5: Route Planning Alternatives

1. Table 5.2.2 and following Tables in this series contain reference in the "Natural Environment" Factor to "right-of-way influence zone" in the context of wells. What is this zone in terms of its intent and extent? The zone should be clearly defined, and should be shown on the route plans.
2. On p. 5-48, the section on Natural Environment should be expanded to include groundwater. Wells, recharge areas and discharge areas should be noted as indicators to be used in assessing potential impacts.
3. Other than some "sketchy" information contained in Exhibits 5.5.2 to 5.5.8, the draft EA does not indicate the ranking of the alternative routes from the noise aspect or for that matter any environmental aspect. The information is normally provided in an EA to assist the reviewer in determining the merits of a particular route with respect to the area of interest. However, we do know from Exhibits 5.5.2 to 5.5.8 that more than a "few" homes will experience increases in noise levels of greater than 5 dB and that most of these homes are located in the Town of Markham and in the Hamlet of Brougham.

Noise is missing from the Table (5.6.7) on p. 5-48.

6. Chapter 6: Description of the Undertaking and Future Work

1. Groundwater:

- (a) P. 6-29 refers to "a review of the groundwater conditions of the study area was carried out", however staff have not seen a copy of the study. Given that there will be some "displacement" of existing residences (p. 6-34, Section 6.4.2), it should be noted here that any existing wells that had been used to supply water to "displaced" residences (or other buildings) will need to be properly abandoned, as required by O. Reg. 903. Proper abandonment is necessary to close potential pathways for contaminants to enter groundwater. Existing septic systems and tile beds will also require proper decommissioning.

2. Stormwater Management:

- (a) on p. 6-30, in the first bullet point, reference should be made to the MOEE "Stormwater Management Practices Planning and Design Manual" (June 1994). This manual should be employed in design and development of stormwater management facilities.
- (b) second bullet point: the use of the words "will strive" is weak and potentially contentious, given that high profile water courses could be viewed as at risk if proper stormwater management is not incorporated into design and development of the 407 extension. Ten lanes of highway represent a considerable volume of stormwater to be collected, managed, and discharged in an environmentally benign manner.
- (c) third bullet point: the use of words "consideration will be given" leaves some doubt as to whether potential adverse environmental impacts will truly be addressed and prevented as part of the undertaking. The objective of BMPs is to minimize adverse effects.
- (d) fourth bullet point: "reasonably achieved" is not clear- what is(are) the alternative(s)?
- (e) It would be useful to include reference to the potential impacts of elevated salt concentrations in stormwater runoff during the spring melt, as they could create adverse effects on spawning fish.

3. Erosion and Sedimentation:

- (a) on p. 6-35, second bullet point states "consider the potential for destabilizing banks". This item leaves some doubt as to whether this will actually be done, and if done, what the products of "consideration" may be. Again, given the profile of the water courses in the study area, it would be wise to provide stronger, more definitive direction. For example, the wording could be improved by stating "investigate the potential for destabilization...develop mitigation strategies...implement approved mitigation strategies through design and construction documents."
- (b) Table 6.6.1. following p. 6-38 does not include groundwater concerns associated with the proposed undertaking. The concerns are (i) impact on private wells from highway construction and maintenance, (ii) abandonment of wells, and ((iii) impact on aquifer recharge areas.

4. Noise:

- (a) Due to the fact that a noise impact study was not performed for the technically preferred route, staff were unable to evaluate with any degree of accuracy the increases in noise levels which will occur along the recommended route and more importantly the potential

for mitigation of the noise impacts.

In reference to the above, this Section of the Report should contain at least a preliminary indication of the potential noise impacts associated with the technically preferred route. The number of homes subject to increases in noise levels of 5 to 10 dB, 10 to 15 dB and greater than 15 dB should be indicated. In addition, a brief description should be given of the potential for mitigation at these homes along with the anticipated acoustical effectiveness of the measures which will be applied.

- (b) A brief description should be given of the increases in traffic noise levels which could occur along the roads in the immediate vicinity of the proposed extension of Highway 407 and of the measures which will be considered to mitigate these impacts. This refers specifically to the increases in traffic volumes expected in Greenwood and possibly other areas along the recommended route.

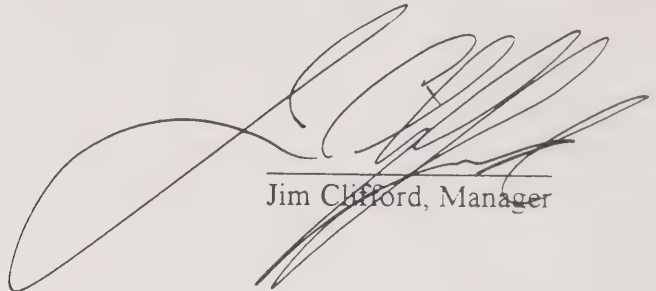
Appendix 7

- 1. On p. 2, each factor considered in the evaluation of the route alternatives was given a "weight". However, the actual "weight" for each factor was never specified.

Appendix 22

- 1. As previously identified, of major concern are the changes made to the MOEE /MTO Noise Protocol with regard to the criteria for considering noise control measures.
- 2. In addition, we have noted the following deficiencies in this Appendix:
 - (a) Section 3.6: No indication is given, "when", prior to construction, the Design and Construction Reports (including the Noise Impact Assessment Report) will be submitted for review and comment by our Ministry.
 - (b) Section 3.5: It is uncertain at what stage in the life of the facility the noise control measures will be installed and whether additional studies (measurements/predictions) will be required to determine if the criteria for mitigation have been reached.
 - (c) Section 4.0: The second sentence should read: " The proponent shall abide by the Protocol as it relates to construction noise and by the Municipal Noise Control By-Laws unless otherwise exempted by the Municipalities."
 - (d) In addition, this Section should indicate the procedure which will be followed with regard to vibration impacts generated by blasting or pile driving operations.

Thank you for the opportunity to review the draft. This office will require 5 copies of the final EA for review. If you have any questions, please contact Elizabeth Janz at (416) 314-7112.

A large, stylized handwritten signature in black ink, appearing to read 'J. Clifford', is written over a horizontal line.

Jim Clifford, Manager

cc. B. Nixon
M. Plewes
C. Krajewski
R. Ryan
B. Hodgins



Ministry of Min. ère des
Natural Richesses
Resources naturelles



50 Bloomington Road West
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January 17, 1997.

Ministry of Transportation
Planning Office
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1201 Wilson Avenue
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Attention: Mr. Paul Jankowski, P.Eng.

Subject: Highway 407/Transitway, Markham Road Easterly
to Highway 7 East of Brock Road
Environmental Assessment Report
Draft for Presubmission Review

The following represents MNR's comments on the above mentioned document:

STORMWATER MANAGEMENT

MNR anticipates OTCC and MTO will recognize the unique nature of the Rouge watershed and the sensitivity of its tributary watercourses. ALL watercourses in the Rouge watershed should be considered as contributing to TYPE I Habitat and, therefore, LEVEL 1 protection criteria applied in the design of the stormwater management scheme. This approach maintains consistency with the previous direction of the adjacent developments (IBM/MINTO and CORNELL).

It is MNR's understanding that MTO/OTCC and their contractor will continue to provide input opportunities through the conceptual, preliminary and detailed design stage.

BRIDGES AND OTHER WATERCOURSE CROSSINGS

The main Rouge River and Little Rouge River are considered significant riverine corridors. Although the EA commits to addressing the principles of aquatic and terrestrial habitat protection (form and function), bridge span widths will not be available until conceptual design. At this time, MNR requests that OTCC maximize the span width ideally from top-of-bank to top-of-bank. We recognize the need for piers or columns in the floodplain but wish to emphasize the need for detailed site assessment to determine the least destructive means of access and



construction. We suggest a span bridge design similar in nature to the Burnhamthorpe Road crossing of the Credit River or the 407 crossing of the West Humber at Clairville.

FISH HABITAT

As per previous comments, some of the Rouge tributaries identified by MTO inventories are categorized as intermittent with no direct habitat values. Some of these watercourses have been identified as fish habitat by MNR and DFO through investigations at adjacent developments. This inconsistency should be recognized in the subsequent project planning stages. Fisheries Act authorization and compensation will be required. Please refer to the copy of biologists concerns provided to MTO at the September 30, 1996 meeting with MNR.

Similarly some tributaries within the Duffins watershed are referred to by MTO as intermittent with low habitat value. This ministry manages fisheries on a system/watershed basis, and fisheries habitat downstream of the Highway 407 ROW must be included in the review when determining the protection level criteria for stormwater.

Other specific comments and questions relating to the Environmental Assessment Report (EAR) Preliminary submission include:

- pg 1-3 MNR concurs with the idea of a Stakeholder Consultation Process (SCP) as a condition of approval for a fast tracking the EA.
- pg 1-4 states that "a draft of the EAR was distributed to government reviewers in December 1996 for pre-submission review". The next line states that the comments are summarized in Chapter 5. As Chapter 5 has already been written and is included as part of this review, how does Chapter 5 reflect the comments of government agencies that have yet to comment? Chapter 5 as written may reflect agency reviews to date, and should be revised as necessary to accommodate any new comments if received.
- pg 1-5 the EA report refers to a freeway, 10 lanes, with basic 100 metre ROW and transitway with 60 metre ROW. When determining stormwater requirements, and addressing environmental concerns, will MTO/OTCC accommodate concerns for initial lane construction, ie. 4 lanes,

10 lanes, and/or include the proposed transitway? Will additional stormwater facilities be required at a later date, and will ORC reserve enough land for future expanded works? It is important that the regulatory agencies be aware of OTCC/MTO's intentions regarding this matter.

pg 1-9 1.3.3 Monitoring.

Based on: "MTO may collect baseline technical information required for its environmental monitoring program", and "environmental monitoring after a project is completed may involve follow up monitoring"...MTO has made no formal commitment to type or degree of monitoring at this time. Monitoring should be discussed with other agencies in the SCP.

It is this ministry's position that monitoring will be required at specific watercourse crossings to determine effects on fisheries community. This will likely be a requirement of MNR and DFO as a condition of Fisheries Act authorizations.

pg 1-22 "the Project Team undertook additional consultation with MNR and MTRC and resolved the remaining outstanding issues"... Please add a statement "that although many issues have been resolved, issues relating to structure selection and design will receive discussion and be resolved through review agency and stakeholder participation using the SCP".

pg 2-30 last paragraph. End of sentence missing.

Table 3.2.2

under Extended Highway: "completion of Hwy 407 Central".

Safety: Extended Highway 407 Easterly....pedestrian walkways/hiking trails under bridge structures should be considered for pedestrian safety.

Exhibit 4.2.1

Rouge River and Little Rouge River, West Duffins, and Duffins are managed as Coldwater. This ministry also acknowledges the presence of warmwater species. Construction timing guidelines will reflect spawning impacts to species present at the crossings, downstream from the crossings, and migrating through crossing areas.

Migratory fish are known to travel past the ROW on the Little Rouge Creek.

Please note that in 1996 the Salmonid Ecology unit captured redbside dace downstream of the confluence of Ganetskiagon and its tributaries, south of Concession Road 5. Migratory salmonids spawn in this area, and 4 species of salmonids have been captured at this location. Exhibit 4.2.1 shows neither migratory coldwater or coldwater status for this portion of the Duffin's watershed.

pg 4-6 "as original source data to determine high water tables were not identified, so one must use this data with caution"..... this suggests that in specific instances hydrogeological studies may be required at certain water crossing locations. Please consult with MTRC and MOEE to determine if any new studies have been prepared regarding ground water in the Highway 407 study area.

pg 4-7 please add to the section on hydrogeology the following: Groundwater/springs exist in the vicinity of AL1380 to the East of Brougham.

Exhibit 4.2.3

Rouge River and Little Rouge River are managed for coldwater, coldwater migratory, and warmwater fish species. West Duffins Creek is managed for coldwater and coldwater migratory fish species. Please also note that flow was observed at West Duffins Creek tributaries at (14) and (15) in October 1996.

Flows were also observed downstream at (17A), (19), (20), (21), and (24) Concession Road 5 by this ministry in October 1996. Baitfish were observed by this ministry upstream of (25) at Highway 7 in October 1996.

Flow was observed by MNR along Highway 7 upstream and downstream of (31) and downstream of (32) at Brock Road. In the vicinity of (36), (37), and (39) high potential for ground water upwelling would be more appropriate than marginally high potential. Sites (33) through (43) are found in an area known to contain brook and brown trout. Duffins Creek should be referred to as Coldwater.

- pg 4-11 "migratory runs of coldwater salmonids are prevented from accessing the study area waters of Little Rouge Creek by a dam located near Finch Avenue". There are no dams downstream of the ROW that prevent coldwater salmonids access to the study area.
- pg 4-12 please note that the ministry has sampled salmonid species both above and below the HWY 407 crossing of West Duffins Creek.
- pg 4-13 please note that upstream of Green River, West Duffins Creek branches into two coldwater streams: Major Creek and Reesor Creek. Reesor Creek contains brook trout and MNR biologists manage waters upstream of the Whitevale Dam for brook trout.
- pg 4-13 Urfe Creek is managed as a coldwater intermittent system. Although this creek may have warm water species common throughout its watershed, coldwater species seasonally utilize the lower portions of this subwatershed in proximity to Duffins Creek. As recent as 1991 rainbow trout and mottled sculpin were captured between Concession 4 and 5. Groundwater makes a significant contribution in supporting the fishery at this location. Any stormwater inputs upstream must take into account increases in temperature to the watercourse.

- pg 4-16 please note the significance of these wetlands relative to their locations within the watershed.
- pg 4-17 4.2.6 Wildlife and Wildlife Habitat: please note that larger mammals such as deer move through open areas at night. A series of close or near contiguous woodlots would indicate the likelihood of deer movement between blocks of forested area.
- pg 4-22 the EAR states that "watercourse size, therefore, is the product of the number of upstream tributaries and their combined volume". This ministry would also like to stress that watercourse quality is the product of upstream tributaries and their combined qualities. Qualities are reflective of changes in site specific enhancements, and losses, including water upwelling areas, changes in cover, availability of substrate, degree of vegetative cover, stabilization of banks, alterations in drainage, temperature/stormwater impacts.
- pg 4-23 Spring Creek provides fish habitat on a seasonal basis. In some years Spring Creek may provide habitat year round.
- pg 4-34 What will be the impacts on the Pickering Rod and Gun Club? If relocation is required, has a suitable and agreeable location been found to accommodate this interest group?
- pg 4-50 stated that wetlands were delineated using airphoto interpretations. What percentage of these wetland areas were groundtruthed?

Table 4.8.1

for Hydrogeology, under Concerned Agency and Group, please add MNR

Table 4.8.1

for Geotechnical, under Sensitivity/Issue, is erosion of the eastern bluff still a concern, upstream of the Highway 407 crossing of the Rouge River?

pg 5.5.3 for South of Locust Hill please explain the statement: " Greater number of impacts in Rouge River watershed are related to influence on Petticoat Creek headwater area (warmwater stream) "

Exhibit 5.5.4

for South of Brougham please eliminate the word "marginally" from marginally less desirable...

pg 5-42 Natural Environment- please remove "staging" and replace with "timing", in "impacts are associated with the facility construction and not the staging of this construction". Staging of construction may well have an impact on natural environments at stream crossings.

pg 6-1 please insert " a guarantee for a minimum of" 6 bridged watercourse crossings

6.2.4 and
6.2.3 plate 3

Are there any environmental implications relating to the realignment of Highway 7?

pg 6-10 this ministry acknowledges the intent that preliminary design and detailed design phases may be combined as an evolving process similar to the method of conducting business for Highway 407 Central.

Table 6.4.1

*Please note MTO has included crossing types for all crossing locations. Relating to the heading: under River/Creek Name, a statement should be included suggesting "crossing Type as proposed by MTO/subject to review/ clarification by participating agencies and SCP".

This table does not presently take into account system function. Fish species composition may be very different outside the HWY 407 ROW.

- pg 6-27 please note that the central stoneroller has been captured downstream of the proposed HWY 407 crossing of the Rouge River at Parkview Golf Course.
- pg 6-27 the statement Ministry of Transportation conducted fish sampling at each crossing... MTO did not sample every crossing, as visual observations were also made, due to limitations of sampling gear. When MTO staff felt that not enough water was present for electroshocking, no sampling occurred. The small number of Field collection records received by MNR also indicates that sampling likely did not occur at all of the selected sample stations. Therefore it would be more appropriate to state that fisheries inventory related observations were made at each crossing by MTO. The fish community information collected by MTO at proposed HWY 407 crossings is valuable information, and will be included by MNR in its review of fisheries habitat issues for referral to DFO.
- pg 6-28 First paragraph under Watercourse Crossings: the phrase "if a new crossing is required" should be deleted.
- pg 6-28 Avoid the placement of piers within the watercourse channel under bankfull flow conditions... Placement of piers in the bankfull channel will be discouraged by MNR.
- pg 6-30 To protect groundwater resources, the following objectives apply: please add "the contractor shall be responsible for addressing impacts of construction on shallow groundwater and its dependent fisheries"
- pg 6-31 please eliminate... "sometimes" from sometimes allow for the passage of animals

Table 6.6.1

Upstream Flood Levels..... under Proposed Mitigating Measures please change to: "A drainage analysis will be carried out to assure that crossings are designed to minimize erosion and flood risk".

Groundwater Upwelling Areas...under Proposed Mitigating Measures please change to: "Open bottom culverts/bridges will be required in upwelling areas".

Please note that references to structure types... ie. may be placed in to a culvert, are contingent on agreement with the SCP participants, MNR and DFO.

Rouge River/Little Rouge Creek, and Petticoat Creek will require water quality and quantity control that addresses Level 1 criteria and erosion control to 2yr (25mm/first flush).

Rouge River 9th line/ AL1794 is an intermittent tributary which provides aquatic function but no direct habitat.

9th line/10th line/ AL1780/Potential Environmental Effects....states that impacts are not considered to be significant. Please note that Hwy 407 Aquatic Terrestrial technical report suggested Moderate corridor value for terrestrial units 1791 and 1792 in the vicinity of AL1780. AL1780 is considered to be fisheries habitat.

AL1761 is an intermittent tributary which provides aquatic function but no direct habitat.

AL1760 is considered to be fisheries habitat.

AL1720 is considered to be fisheries habitat.

AL1719 is considered to be fisheries habitat.

AL1610, AL1611, AL1613 all flow into West Duffins Creek upstream of the Whitevale dam. Upstream of the dam is managed for brook trout, and downstream for migratory and resident salmonids. Rainbow trout have been captured below the dam suggesting that West Duffins supports salmonids year round in the area designated by MTO as a warmwater reach. AL1630 should be changed in the table from a highly significant warmwater fishery to highly significant coldwater fishery. AL1630 is noted as coldwater in Table 5.2.3 of the HWY 407 Aquatic and Terrestrial Technical Report.

AL1570 and AL1580 are intermittent tributaries at the HWY 407 ROW. Rainbow trout are reported from below the confluence of these tributaries and upstream from West Duffins Creek. Ten rainbow trout were captured in 2686 shocking seconds by MNR's Salmonid Ecology Unit on September 9, 1996 at this location.

AL1560 (Ganetskiagon Ck) as sampled in 1996 by MTO resulted in no fish captured. MNR captured YOY (young of year) brown trout, YOY brook trout, and YOY rainbow trout downstream at Taunton Road in July 1994. In July of 1996 redbside dace were captured in

Ganetskiagon Ck by MNR's Salmonid Ecology unit, below the confluence of tributaries AL1560 and AL1510, upstream from Taunton Road. Therefore Ganetskiagon Ck. is a highly sensitive, coldwater stream, downstream of the ROW, which may potentially be impacted by the highway. Appropriate mitigation and BMP's will be required.

AL1470. Please note the scoring for the following Terrestrial Units as presented in the HWY 407 Aquatic and Terrestrial Technical Report (ATTR): TA1480 (9), TA1481 (8), TA1482 (8), TA1483 (9), TA1484 (15), TA1485 (8). These terrestrial units presently provide a wide corridor, provide a diversity of values, exhibit high contiguous value through riparian connection, and the criteria of the ATTR suggests that the terrestrial features and corridor is highly valued. This requires further discussion, as the AL1470 crossing location does not show as pronounced an incised valley as at AL1460, and may be difficult to span. The concept of a span should be discussed. Table 6.6.1 should reflect the above terrestrial values, and state that corridor values will be reviewed with agencies/stakeholders in the the SCP.

AL1420 and AL 1400 are intermittent coldwater streams. AL1380 is listed as significant coldwater. Below the confluence of AL1420, AL1400 and AL1380, the salmonid Ecology Unit captured 6 brook trout, 83 rainbow trout, and 1 brown trout in a total of 2965 shocking seconds. This suggests that the water quality of these watercourses is significant to the production of salmonid fishes.

Appendix 16

Correspondence: MTO Fisheries Report was reviewed by MNR, and discussed during September 30 meeting at MNR. Observations of fish species, and habitat classifications by MTO are localized interpretations within the 407 ROW. Habitat observations by MTO does not necessarily reflect considerations for system function. At the September 30 meeting, MNR provided MTO with a memo: re crossings and Fisheries Act requirements within the Rouge watershed. As the revised MTO fisheries report does not reflect MNR's site specific comments, the fisheries document is accepted on the condition that MTO acknowledges that it is aware that MNR will be using system function as a criteria for stormwater management and impact to fisheries. There is still some debate as to the warmwater, coldwater designations, with respect to impacts as information within the ROW does not reflect positive impacts of groundwater/upwelling downstream of the proposed Highway ROW.

Correspondence from MNR to MTO regarding the review of the Draft Stakeholder Consultation Process, and the Aquatic and Terrestrial Technical Report

Comments are acknowledged in the Correspondence summary in the Appendices of the EAR. MNR's comments, however have not been incorporated into the EA report.

The EA report acknowledges that MNR has had input into the final selection of the S3S routing alternative of HWY 407. Considering the adjustments required to accommodate the many interests and values in the planning of the route, this ministry is satisfied that the S3S alternative as presented is the most suitable option.

Appendix 19.1

The EAR does not reflect MNR's January 17/96 comments to the Aquatic and Terrestrial Technical Report. The insertion in Appendix 19.1 has not been revised to reflect MNR's concerns. At the September 30 meeting MNR and MTO agreed on a approach suitable to both ministries for outlining fisheries/watershed values which is now included as part of the SCP. A passage indicating Appendix 19.1 is unrevised and that the SCP will take into account concerns/ information from commenting agencies during the SCP should be included.

Table 5.3

The summary of Fish and Aquatic Habitat Findings appears to be incomplete/simplistic for Comments on Special Features/Sensitivities. For example there are no references to potential impacts downstream, and no reference to MNR's circulated memo re: Fisheries Act and the Rouge River Tributaries. Sensitivities will be more evident during design selection and input by review agencies during in the SCP.

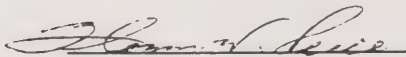
Appendix 19.2 Comments as per Appendix 16.

Appendix 21

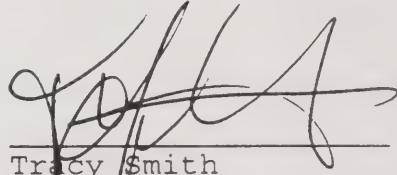
As per MNR's December 12/96 letter the need for addressing wildlife corridor values is mentioned in the EAR (pg 6-32) but is not detailed in the SCP. Further consideration for evaluating wildlife and corridor values as earlier requested by MNR and MTRC should be included in the SCP. A table outlining values should be prepared to address concerns during the SCP stage, as has been done with fisheries in the SCP document.

Any questions regarding the above comments should be referred to Dave Ross (HWY 407 biologist) at 905-713-7389. Mr. Ross will arrange meetings between MTO and the appropriate staff to address concerns relating to this EA comments submission.

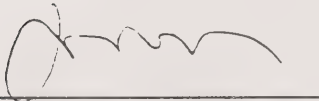
Sincerely,



Glenn Price
Area Supervisor
Durham Area Team



Tracy Smith
Area Supervisor
York South area Team



J. K. Barker
District Manager
Greater Toronto Area District

/DJR

cc. Wayne Hyatt, DFO
Don Haley, MTRCA
Tim Rance, Biologist (Durham A.T.)
Mark Heaton, Biologist (York A. Team)
Glen Hooper, (District Ecologist)



the metropolitan toronto and region conservation authority

5 shoreham drive, downsville, ontario. m3n 1s4 (416) 661-6600 FAX 661-6898

January 23, 1997



Ministry of Transportation
Planning Office
Central Region
3rd Floor, Atrium Tower
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Downsville, Ontario
M3M 1J8

Attention: **Mr. Paul Jankowski, P.Eng., Project Director**
Highway 407 East

Dear Sir:

**Re: Environmental Assessment Report - Highway 407 / Transitway, Markham Road
Easterly to Highway 7 East of Brock Road, Draft For Pre-submission Review**

The Metropolitan Toronto and Region Conservation Authority received the above noted draft document and has had an opportunity to briefly review the document. The Authority has also met with staff of the Rouge Park and has incorporated their comments as well. This letter contains only the comments which we feel represent major areas of concern that we and staff of the Rouge Park have with the overall content of the document.

The Authority's objectives in reviewing this initiative to construct a major highway bisecting the watersheds of the Rouge River, Petticoat Creek and Duffins Creek are to ensure the continuity of healthy watershed ecosystem functions and, through careful design, to ensure that highway 407 does not result in the isolation of the lower portion of the watersheds from its upper reaches in terms of water movement, aquatic and terrestrial habitats and public use.

This document presents very little additional environmental information to that documented in the Aquatic and Terrestrial Biological Study done for the technically preferred route. Most of that information was collected in the early 1990's. It is our understanding that any new information would be gathered and used through the proposed Stakeholder Consultation Process described in Chapter 6. We note that since this original work was done, new information is now available through such things as the development of the Rouge Park Plan (including the trails and vegetation management plans), the work currently underway for the Rouge Park North, the Authority's update of the Whitevale Corridor ESA and work undertaken by the Authority and the Ministry of Environment and Energy on behalf of the Ontario Realty Corporation on the Duffins Creek watershed. This report should confirm that this new information will form part of the analysis/evaluation of design options through the SCP.

Both MTRCA and Rouge Park staff still have concerns with the proposed SCP. First, comments that were provided on the draft in the fall of 1996 have not been fully addressed, although the EA indicates that they have been resolved. We also have additional comments in the context of the EA document as outlined below:

- We feel that municipal staff should form part of the SCP so that the environmental and open space planning for the communities along the corridor such as Cornet, Boxgrove and Seaton are not overlooked.

.../2

- Table 6.3.1 concentrates on the fisheries component of the crossings. The single column for "Other Environmental Considerations" does not provide enough information on the scope and scale of these considerations. At a meeting last fall we discussed the need to include such things as terrestrial habitat and corridors, public access, storage and passage of flood flows, erosion, ESA features and functions as part of this analysis.
- Since the details on the environmental considerations and design are going to be resolved through the SCP there needs to be the maximum flexibility at that stage. We feel that the column in Table 6.6.1 that suggests culverts for some crossings is premature and the report should just indicate that at this time we know that there will be spans required at six crossings and the remainder will be determined through the SCP.
- We would suggest that the issue of monitoring be defined through the SCP. Currently this is covered on page 1.3.3 within the EA, but is very vague and therefore open to interpretation.
- The section on Construction Phase (section 6.3.4, page 6-12) needs to clarify the role of the stakeholder with respect to the construction plans. Are they to be forwarded for review and comment/approval, or for information purposes?
- The section noted as Follow-up (page 6-36) should have the first bullet point dealing with construction/contract measures expanded to include a reference to commitments to an environmental site inspector at crossings where it is deemed necessary as defined through the SCP.

The reference to the Rouge Park Alliance resolution on page 1-22 should be revised to include , further resolutions, as noted below, regarding Highway 407 made at the December 11, 1996, meeting.

THAT the Rouge Park Alliance be represented at 407 Stakeholder Meetings by Ron Christie, Chair, Rouge Park Alliance, or Gord Weeden, General Manager of the Rouge Park;

THAT the Chair or General Manager may draw on the expertise of any of the Rouge Park Subcommittee members that he wishes, depending on agenda items to be discussed;

THAT it be made clear to the 407 representatives, that, at the discretion of the Rouge Park Alliance representative, any number of subcommittee members may accompany the Alliance representative to the stakeholder meetings;

AND FURTHER THAT the Rouge Park Alliance submit a Position Statement to the 407 Stakeholder as recommended by the Rouge Park Natural and Cultural Heritage Subcommittee (under separate cover).

In chapter two, under the Other Considerations (section 2.4, page 2-29), reference is made to the Durham Official Plan and additional east/west roadway connections. The direction that there be no new roadway crossings within the Rouge Park should also be reflected as a position affecting the roadway usage.

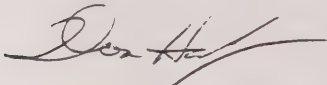
The section on crossing of the CPR and the Little Rouge (section 6.3.5, page 6-13) indicates that the design of the Little Rouge crossing is separate from the CPR. This cannot be the case from a design perspective given the closeness of these two structures and the comment should be clarified to reflect that the separation of these crossings deals only with approval related to grade separation from the Canadian Transportation Agency.

The inclusion of the Transitway within the corridor may need to be discussed in more detail. The design selected for the highway crossing must be made in light of any future requirements for the Transitway such as stormwater or access which may effect property requirements or alignment and the resources therein. The level of detail and implications of the Transitway design on the highway and vice versa are not defined in sufficient detail within the EA nor are they provided for in the SCP.

We recognize that this report is a pre-submission draft; however, the exhibits (maps) of the natural features etc. were very difficult to read due to the scale. It will be important that the final submission have maps and figures that are easy to read and interpret.

As noted earlier, due to the short time for review we have tried to confine our comments to the main areas of concern. We understand the Ministry is also working under severe time constraints regarding the submission of this EA. To this end staff of the Rouge Park and the Authority would be pleased to meet with you as soon as possible to discuss our comments in further detail.

Yours truly,



Donald R. Haley, P.Eng.
Project Engineer
Resource Science Section
Watershed Management Division

/dh

cc: Brian Denney, MTRCA
Dave Dyce, MTRCA
Dave Ross, MNR
Dena Lewis, MTRCA
Bernie McIntyre, MTRCA
Mary Asselstine, MTRCA
Gemma Connolly, MTRCA
Gord Weeden, Rouge Park



North Pickering Development Corporation

25 Grosvenor Street, Toronto, Ontario M7A 1R1
(416) 314-0770 phone (416) 314-0775 fax

January 6, 1997

Paul Jankowski, Project Director
Highway 407 East
Planning Office, Central Region
Ministry of Transportation
3rd Floor, Atrium Tower
1201 Wilson Avenue
Downsview, Ontario
M3M 1J8

Dear Mr. Jankowski:

Thank you for providing us with a copy of the draft Environmental Assessment Report for a partial extension of Highway 407/transitway from Markham Road to Highway 7 east of Brock Road, for our review and comment. We appreciate the opportunity to review the report prior to its submission to the Ministry of Environment and Energy under Ontario's Environmental Assessment Act.

I draw your attention to the assumption in the report about the projected population for Seaton within the timeframes under consideration. As it currently stands, the draft report states that the target population of Seaton is 90,000 people and 45,000 jobs by the year 2021. The Region of Durham in its Official Plan sets a target of 45,000 people and 22,500 jobs for Seaton by the year 2021, while recognizing the higher level of 90,000 people and 45,000 jobs as the basis for the ultimate land use and infrastructure planning for Seaton. References to Seaton's population appear several times within the draft EA report, for instance on pages 2-21 and A23-3. Incorporating the lower population targets for Seaton up to the year 2021 may necessitate adjustments in those sections of the report which outline the extent of capacity deficiencies in the transportation network by the years 2011 and 2021, e.g. section 2.3.4.2.

The map labelled as Exhibit 4.3.1. (Agriculture) should have the words "Town of Seaton" expunged. Seaton is a future development area within the Town of Pickering. The description of Seaton on page 4-41 contains some inaccurate information. Please see the attachment for details of the revisions required.



Table 3.2.2 in Chapter 3 summarizes the assessment of transportation system planning alternatives. We are concerned that the Community Impacts section does not address the potential impact of the intended interchanges which will connect Highway 407 with north-south arterial roads, nor are the interchanges explicitly addressed under Aesthetics. Hence the impact of the interchanges is not specifically included within the EA review, which could lead to later controversy. The EA document merely notes elsewhere that the exact location of the two interchanges within the Seaton lands will be confirmed during the Seaton Structure Plan which is currently being undertaken by the North Pickering Development Corporation. As proposed earlier by MTO, one of those interchanges would be situated at North Road, close to the existing community of Whitevale.

The prior comments are specific to the Seaton planning exercise. In addition, you may wish to review Table 2.2.2 on page 2-13 since it appears that the figures for person travel and vehicle travel in the category Auto Trips should be reversed. On page 2-16, paragraph three, the word "overstated" should replace "understated".

Sincerely,

A handwritten signature in cursive script that reads "Annette Payne".

Annette Payne
Manager

encl. (1)

the area. The proposed community was also referred to as the Ninth Line Community and was renamed Cornell in spring 1994. The Secondary Plan for the Cornell Community was approved with modifications by the Ministry of Municipal Affairs in July 1995.

→ Approximately 625 hectares are designated for urban development in the Secondary Plan. The land in question is bounded by the Ninth Line, just north of Sixteenth Avenue, the Little Rouge Creek and the proposed Highway 407. The Cornell community is a mixed use development. ~~At least 35% of the residential units will be for affordable housing to comply with provincial policies.~~ The community will house an ultimate population of 27,300 and the projected number of dwelling units is up to 10,000 units.

Cornell is composed of six neighbourhoods, linked along a central boulevard that is also a major transit corridor. Within each of the neighbourhoods, there will be a wide range of housing choices built in the neo-traditional style, and ranging from cottages to single family units, semis, four-plex villas and apartments. A central core area is located between the existing Markham-Stouffville Hospital and Highway 7 and features a walking main street with shops, offices, restaurants and entertainment venues.

Seaton

2,800
~~10,200~~ ha Seaton development proposes a ^{mix} ~~balance~~ of residential, commercial, industrial ^{and} recreational and agricultural land uses, along with an open space buffer on the western and southern boundaries for the purpose of protecting historical, agricultural and recreational resources. It would also accommodate servicing and transportation corridors. Within the development strategy, existing hamlets and subdivisions such as Whitevale, Locust Hill, Martin's Subdivision, Cherrywood and East Cherrywood would be preserved. and Green River

on the east side of the West Duffin Creek.

Urban development of the Seaton lands

The proposed community has been approved in the Region of Durham and Town of Pickering Official Plans, and a Secondary Plan for the community is under preparation in accordance with the local Official Plan.

The Ontario Realty Corporation ~~still~~ maintains its holdings within the designated site, which remains largely in agricultural use, ~~with farm residences and scattered rural residences and hamlets.~~

ownership and manages the Seaton site,

Delete this paragraph {
~~At the time of the Route Planning Study, the conceptual Secondary Plan strategy included a Highway 407 alignment at mid-concession 5, flanked by industrial uses on the north between Sideline 30 and Brougham Creek, and by the north limit of the residential community on the south, including a significant Community Commercial Area in the vicinity of Lots 22 and 23. Extensive Special Study Areas were designated on "transition" lands surrounding the Hamlets of Whitevale, Green River and Brougham for which additional investigation of appropriate development strategies were stipulated.~~



Ontario Realty Corporation
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January 10, 1996

Mr. Paul Jankowski, P.Eng.
Project Director
Highway 407 East
Ministry of Transportation
Planning Office, Central Region
3rd Floor, Atrium Tower
Downsview, Ontario
M3M 1J8

Dear Mr. Jankowski:

Subject: Highway 407/Transit Way
Markham Road Easterly to Highway 7
East of Brock Road - Pre-submission Review

Thanks for the opportunity to review the documentation associated with the above captioned matter.

The Ontario Realty Corporation does not have concerns to register at this time.

Please keep me posted on developments associated with this proposal.

Finally, excuse my tardiness in responding to your request for comments.

Yours truly,

R. M. Farewell
Environmental Planner





Environment Canada
Environnement Canada

Environmental Policy, Planning, Assessment & Citizenship Division
Great Lakes & Corporate Affairs Office
Environment Canada, Ontario Region
P.O. Box 5050, 867 Lakeshore Rd.
Burlington, Ontario L7R 4A6

File No.: F-95-98

January 3, 1997

Paul Jankowski
Project Director, Highway 407 East
Planning Office, Central Region
Ministry of Transportation
3rd Floor, Atrium Tower
1201 Wilson Ave.
Downsview, Ontario
M3M 1J8

Dear Mr. Jankowski,

Re: Hwy. 407/Transitway - Markham Rd. Easterly to Hwy. 7 East of Brock Rd.
Presubmission Review

This is in response to your letter of 9 December 1996, regarding the provincial environmental assessment for the above mentioned proposal by the Ministry of Transportation (MTO). Thank you for providing Environment Canada - Ontario Region (DOE-OR) the opportunity to review and comment on the draft Environmental Assessment Report for this proposal prior to its submission to the Ministry of Environment and Energy. We understand that this proposal will also trigger the federal *Canadian Environmental Assessment Act* (CEAA), and it is intended that the EA report will be used to meet CEAA requirements.

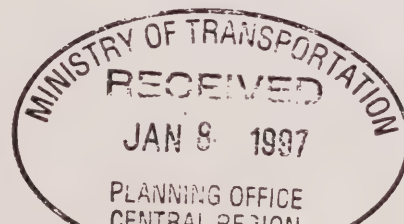
It is in this regard that DOE-OR's Environmental Assessment Coordinating Committee (EACC) has reviewed this EA report, in order to provide specialist department information or knowledge per section 12(3) of CEAA to assist the federal Responsible Authorities in their eventual screening of this project. Information and comments should not be construed as a fettering of the government's ability to make decisions and/or enforce any applicable regulations. The following comments are provided for your consideration.

The specific areas of interest to DOE which this proposal may potentially affect are migratory birds (and their habitat), and water quality impacts as a result of deleterious substances (i.e. deposit of potentially deleterious materials into the waterbody during construction and operation phases, including accidental spills.

With respect to water quality issues, we do not have any major concerns as the EA Report adequately considers the issues raised previously by our department during our prior meetings and reviews of MTO EA commitments. We expect to have the opportunity to comment on specific details of the project when federal EA approvals are being sought, likely at the preliminary and detail design stages, in order to determine how well the commitments for environmental mitigation presented in the current EA report are implemented at that later stage.

With respect to migratory birds and wildlife issues, unfortunately, due to other commitments, we were not able to complete our review of the draft EA report within the time period requested. As such, we cannot comment on this aspect at this time. **We would appreciate receiving the final EA submission from the MOEE during the agency review period in order for us to evaluate this issue.**

Canada



We do have a few minor editorial comments for your consideration to assist in the finalization of the EA report, as detailed below:

Chapter 4 - Table 4.8.1 "Summary of Identified Environmental Sensitivities and Issues":

- Under the "Natural Environment" factor, "DOE - Environment Canada" was not included in the list of abbreviations (pp. 1,2).
- Fisheries (p.1) - DOE should also be included as a "Concerned Agency" along with DFO as we provide advice to DFO in regard to deleterious substances pertinent to bullet item: "Potential impacts of contaminants associated with roadways".
- Ecosystem Integrity (p. 2) - DOE should also be included as a "Concerned Agency" based on our interests in wildlife habitat.
- Additional bullet items should be included to consider cumulative impacts of development on water quality, fisheries, and wildlife habitat under the heading "Sensitivity/Issue" of the Natural Environment factors, with DOE (and DFO) included as a "Concerned Agency" (to address EA requirements under CEAA).

Chapter 6:

- Page 6-32, last paragraph - Planting programs do not appear to include provision to use native species.
- Page 6-37, last bullet item - To clarify and reinforce the proponent's commitment, we propose that the bullet item be expanded to include: "If a monitoring plan is needed, a plan will be developed and implemented as appropriate."
- Page 6-38 - We prefer that the "DOE" abbreviation be defined as "Environment Canada".
- Table 6.6.1 - As for Table 4.8.1, we suggest that DOE be included as a Concerned Agency in all cases when potential environmental effects on water quality (impacting fish habitat) are identified, such as stormwater runoff, erosion and sedimentation. Also, DOE has been identified as a "Concerned Agency" along with DFO for several watercourse crossings not likely requiring a *Fisheries Act* authorization by DFO (and thus no CEAA screening) since no fish were found in the watercourse. In these cases, it is unlikely that DOE will be involved as a Federal Authority.

If you have any questions regarding these comments, do not hesitate to contact me at (905) 336-4953.

Yours sincerely,



Rob Dobos
Secretariat, Environmental Assessment Coordinating Committee
Environment Canada -Ontario Region

cc: B.Bien, EACC
M.Shaw, GLCA
J.Fischer, ECB
A.Robertson, CCG/DFO
W.Hyatt, FHM/DFO
P.Lacoste, NTA
G.Higgins, MOEE

JAN 27 1997 11:52 AM ECB-BURLINGTON 19053364906 TO 14162354940 P.02/07
Environmental Assessment Office
Environment Canada, Ontario Region
P.O. Box 5050, 867 Lakeshore Rd.
Burlington, Ontario L7R 4A6

File No.: F-95-98

January 24, 1997

Paul Jankowski
Project Director, Highway 407 East
Planning Office, Central Region
Ministry of Transportation
3rd Floor, Atrium Tower
1201 Wilson Ave.
Downsview, Ontario
M3M 1J8

Dear Mr. Jankowski,

Re: Hwy. 407/Transitway - Markham Rd. Easterly to Hwy. 7 East of Brock Rd.
Presubmission Review

This is in response to your request for comments with respect to migratory birds and wildlife issues, regarding the provincial environmental assessment for the above mentioned proposal by the Ministry of Transportation (MTO). Comments on water quality issues were provided in correspondence from Mr. Rob Dobos, dated January 3rd, 1997. Thank you for adjusting your schedule to allow Environment Canada - Ontario Region (DOE-OR) the opportunity to review and comment on the migratory bird and wildlife aspects of the draft Environmental Assessment Report for this proposal, prior to its submission to the Ministry of Environment and Energy. We understand that this proposal will also trigger the federal *Canadian Environmental Assessment Act* (CEAA), and it is intended that the EA report will be used to meet CEAA requirements.

It is in this regard that DOE-OR's Environmental Assessment Coordinating Committee (EACC) has reviewed this EA report, in order to provide specialist department information or knowledge per section 12(3) of CEAA to assist the federal Responsible Authorities in their eventual screening of this project. Information and comments should not be construed as a fettering of the government's ability to make decisions and/or enforce any applicable regulations.

The specific areas of interest to DOE which this proposal may potentially affect are migratory birds (and their habitat), and water quality impacts as a result of deleterious substances (i.e. deposit of potentially deleterious materials into the waterbody during construction and operation phases, including accidental spills).

With respect to migratory birds and wildlife issues, we have the following specific recommendations, and detailed comments for your consideration. Please note that our comments are restricted to the "Terrestrial Area (TA) Feature Types" associated with the three "Aquatic Linear (AL) Feature Types" (Rouge River AL1900, Little Rouge Creek AL1700, and West Duffin Creek AL1630), which correspond to the three major bridge crossings.

Specific Recommendations

- Provide Volume 2 of the Fenco MacLaren Detailed Aquatic and Terrestrial Biological Study as a supplement to the Environmental Assessment Report.

- Conduct additional vegetation surveys in specific vegetation units if there are data gaps that suggest significant plant species may have been missed.
- If significant plant species are found, transplant specimens to a safe area outside of the R.O.W.
- Take advantage of any opportunities to retain exceptional tree specimens, by altering the line of clearing at the edge of the R.O.W., if at all possible.
- All topsoil disturbed on the R.O.W. should be used for 407 corridor rehabilitation.
- Native species of trees, shrubs, grasses and forbs should be used to the maximum extent possible in site rehabilitation (i.e. All wetland plants used should be native species, but the use of native grasses, and forbs may be restricted to areas of low erosion potential).

Detailed Comments

In a "Note To The Reader", at the beginning of Appendix 20, the consultant (Fenco MacLaren Inc.) states that, "The following is an excerpt from [the] Vegetatio[n] & Wildlife (Terrestrial Biology) Section of the Detailed Aquatic and Terrestrial Biological Study completed by Fenco MacLaren Inc. in 1995.". It is further stated that, "The unit descriptions are complemented by detailed data records (see Volume 2) for each unit. In keeping with the somewhat 'general nature' of the unit descriptions, generic common names are often used (e.g. willows and sedges). This is done mainly for convenience and in 'most cases', the species are found in the data record.". It is difficult to determine from the review of this draft Environmental Assessment Report whether the consultant actually performed detailed vegetation surveys at these three crossings. The consultant states that, "A list of common and scientific names of plant and animal species mentioned in this report are presented in Appendix 5." (p. 4-15, para. 2). Appendix 5 lists less than a dozen herbaceous plants in the "List of plants and wildlife identified during the route planning phase", and less than half of these are identified to the species level. In the same list, there are 33 species of trees, and 5 species of shrubs, suggesting that the herbaceous layer may have been all but ignored in this summary. In contrast, work performed by others, cited in the following quotes by the consultant, suggests that all three crossings have a high floristic diversity:

Rouge River AL1900 (TA1810 to TA1814 Woodland/Floodplain)

"The herbaceous flora here is diverse reflecting the diversity of habitats." (p. 6-4, para. 4). "Floristic diversity in the R.O.W. is high, and there are several large (cm, dbh) tree specimens; e.g. sugar maple (80), white ash (110) in Unit 1813; red ash (77), sugar maple (77) in Unit 1812; and sugar maple (87) in unit 1810. No rare plants were found in the R.O.W., but four species have been reported from the general area (Gore and Storrie Ltd., 1992);..." (p. 6-4, para. 5). "The general area is reported by Gore and Storrie Ltd. (1992) to be the 'botanically richest area in Markham with 288 species of vascular plants'." (p. 6-5, para. 2).

Little Rouge Creek AL1700 (TA 1711 and 1712 Woodland)

"Gore and Storrie Ltd. (1992) did not report any rare species from the immediate vicinity of the study area, but they do make the point that the Little Rouge River South Area LSA is the largest continuous natural area in Markham and is one of the botanically richest with 281 vascular plant species". (p. 6-14, para. 1).

West Duffin Creek AL1630 (TA1640 and 1641 Woodland/Old Field)

"Floristic diversity is generally high in the R.O.W. reflecting the presence of different habitats in the system. No Rare plant species were observed, but Cases' ladies'-tresses (Rare in York/Metro, but not so in Durham) was observed south of the R.O.W. by MTRCA (1982) in the Whitevale Corridor ESA which extends to the southern edge of the R.O.W." (p. 6-20, para. 3).

Descriptions of the TA Units often mention the common names of several common species of herbaceous plants, but there is no indication of the effort made to discover whether significant plants are present. Various species of plants flower at different times, so plant surveys in a given area, are typically conducted several times during the growing season, to ensure significant species are not missed. "Volume 2" of the Fenco MacLaren Inc. study should be included as a supplement to this Environmental Assessment Report, to demonstrate that these floristically diverse areas have been surveyed in sufficient detail. The consultant mentions, "... observations from field reconnaissance during the summer and fall of 1989 and 1990." (p. 4-15, para. 1), in Section 4.2.5 (Terrestrial Ecological Features). If vegetation surveys were not conducted early in the growing season, it is possible that some significant spring ephemeral species were missed.

The consultant states that, "The proponent will utilize or provide reasonable opportunities for property owners and interest groups to salvage/transplant vegetation and 'seed sources'." (p. 6-31, para. 4). This is a good practice, but if regionally rare species such as Case's ladies'-tresses (*Spiranthes casei*) are found, it should be the responsibility of the proponent to transplant the specimens to a safe location outside of the R.O.W. An organized plant rescue conducted by the proponent may also provide a supply of native shrub material for future rehabilitation of the R.O.W. Native shrubs survive remarkably well in pots, until there is an opportunity to transplant them.

The proponent should take advantage of any opportunities to retain exceptional tree specimens in Units TA1810, TA1812, and TA1813, by altering the line of clearing at the edge of the R.O.W., if at all possible. At the very least, trees immediately outside of the R.O.W. should be protected from damage.

It should be noted that topsoil from construction areas in woodlands, and wetlands, should not be removed from the 407 R.O.W. Topsoil should instead be stored, on site, for use in future rehabilitation, or 'hopscoched' to another location on the 407 corridor, that has an immediate need for topsoil. In order to ensure maximum viability of the seed bank, the height of the topsoil storage piles should not exceed 1 metre.


The Consultant states that, " 'Where site conditions permit' and 'where warranted', [the proponent will] maintain or re-establish riparian vegetation on both sides of the watercourses." (p. 6-29, para. 1). The consultant suggests in a discussion of objectives to reduce wildlife impacts that, " 'Where possible', (the proponent will) develop planting programs in consultation with MNR, MTRCA, RPA and DOE to encourage habitat/corridor functions at watercourse crossings." (p.6-32, para. 3). We believe the maintenance of habitat/corridor functions at the three major river crossings is both possible, and warranted. We therefore agree with the consultant's statement that, "Bridges will reduce vegetation impacts at major valley crossings." (Potential Effects and Proposed Mitigation Table). This table also notes that, "Riparian vegetation will be maintained/re-established", but we emphasize that native species of trees, shrubs, grasses, and forbs should be used to the maximum extent possible, to mitigate the loss of migratory bird habitat. All wetland plants used in the rehabilitation should be native species, but the use of native grasses, and forbs may be restricted to areas of low erosion potential. The consultant notes that, "the significance of this area of the Rouge River system (Units TA1810-1813) is underscored by its designation as Locally Significant Area (L.S.A.) No. 9 - Rouge River Markham (Gore and Storrie Ltd., 1992)." (p. 6-5, para. 2). It is further stated that, "The most significant issues with respect to wildlife is the potential effects on the corridor value of a number of stream valley systems which any alternative route would cross. The Rouge River, Little Rouge Creek and West Duffins Creek are very important in this regard. Bird species diversity is especially high in these systems, and the systems provide an important north-south linkage between the Oak Ridges Moraine and Lake Ontario." (p. 4-19, para. 2). The use of native species will mitigate habitat loss, and ensure that these areas remain significant for migratory birds.

To assist the proponent in obtaining appropriate plant material, we have attached a list of native plant suppliers compiled by the Ontario Chapter of the Society for Ecological Restoration. It is important to note that several of these suppliers are capable of growing large numbers of plants from seed collected locally, provided they are given adequate notice. For example, both the Royal Botanical Gardens, and Big Creek Biota, are producing aquatic, and riparian zone plants, on a large-scale, and, several other contract growers including Otter Valley Native Plants, and Pterophylla, are producing similar numbers of wet meadow, and upland species. Big Creek Biota currently grows

over 140 species, and the RBG is negotiating an agreement with a local greenhouse operator to further expand their aquatic nursery capabilities. The seed collection service provided by these, and other contract growers, will allow the proponent to use plant material that is appropriate to the local bioregion.

If you have any questions regarding these comments, do not hesitate to contact me at (905) 336-4961.

Yours sincerely,



John Fischer
Environmental Assessment Specialist
Environment Canada -Ontario Region

cc: B.Bien, EACC
R.Dobos GLCA
M.Shaw, GLCA
A.Robertson, CCG/DFO
W.Hyatt, FHM/DFO
P.Lacoste, NTA
G.Higgins, MOEE

❖ SOURCES OF NATIVE ONTARIO PLANT MATERIALS: 1996 ❖
Society for Ecological Restoration: Ontario Chapter

Company	Address	City	Postal Code	Phone/Fax	Forms (h: herbaceous, w: woody)	Habitat Types	Catalog	Approximate Percentage Native Stock	Additional Products & Services
Big Creek Biolo	RR #1	Wainingham	N0E 1X0	P: (519) 585-2603 F: (519) 686-2447	plants (h,w) seeds (h,w)	forest, grassland, wetland	free	75-90%	consulting, custom seed collection & growing
Bridgman's Country Flowers Ltd.	RR #1	Sabringville	N0K 1X0	P: (519) 383-6223 F: (519) 383-6239	plants (h) plants (w) seeds (w)	forest, grassland, wetland	\$3.00	<25%	
Campberry Farm	RR #1	Niagara-on-the-Lake	L0S 1J0	P: (905) 262-4927	plants (w) seeds (w)	forest	\$2.00	<25%	consulting and landscape services
Canadian Wildflower Society	4981 Highway 7 East, Unit 12A, Suite 228	Markham	L3R 1N1		seeds (h,w)				seed exchange for members
Gardens of Eden Tree Farm	Box 20	Eden	N0J 1H0	P: (519) 874-1088	plants (w)	forest	\$2.00 (includes shipping)	75-90%	
Gardens North				P: (613) 489-0085 F: (613) 489-0065	plants (h,w) seeds (h,w)	forest, grassland, wetland	\$4.00	25-40%	
Grand River Conservation Authority	Box 728 Clyde Road	Cambridge	N1R 6V6	P: (519) 821-2761	plants (w)	forest	free		
Grivo Nur Nursery	RR #3 Lakeshore Road	St. Catharines	L0S 1J0	P: (905) 905-8773 F: (905) 804-8887	plants (w)	forest	\$1.00	<25%	
Green's Nursery Ltd.	1512 Brock Road	Dundas	L9H 6E4	P: (905) 699-7072 F: (905) 659-3294	plants (w)	forest	free	25-40%	
Humber Nurseries	RR #8	Brampton	L6T 3Y7	P: (905) 794-0655 F: (905) 794-1311	plants (h)	grassland, wetland	free	50-74%	contract growing
Jardins Bonaventure Gardens	18725 Tecumseh Road, RR #5	Tidbury	N0P 2L0	P: (519) 798-3601 F: (519) 882-3107	plants (w)	forest	free		grows woody plants from seed collected in Essex County
Limestone Creek Restoration Nursery	RR #1	Campbellville	L0P 1B0	P: (905) 854-2014	plants (h,w) seeds (h,w)	forest, grassland, wetland	\$2.00 (includes shipping)	100%	seed mixes, contract growing, seminars, design services
Little Otter Tree Farm	RR #6	Tilsonburg	N4G 4G9	P: (519) 842-2419 F: (519) 842-2419	plants (w) seeds (w)	forest, grassland, wetland	free	75-90%	forest management
Metre Toronto & Region Conservation Authority	5 Stoneham Drive	Downsview	M3N 1S4	P: (416) 661-6600 F: (416) 661-6888	plants (w) seeds (w)	forest	free	75-90%	bio-engineering materials
Milligan Seeds	PO Box 700	Osgoode	K0A 2W0		seeds (h)	grassland, wetland	\$1.50	75-90%	

❖ SOURCES OF NATIVE ONTARIO PLANT MATERIALS: 1996 ❖
Society for Ecological Restoration: Ontario Chapter

Company	Address	City	Postal Code	Phone/Fax	Forms (herbaceous, w. woody)	Habitat Types	Catalog	Approximate Percentage Native Stock	Additional Products & Services
Native Plant Source	318 Miley Crescent	Kitchener	N2B 3V5	P:(519) 748-2288 F:(519) 748-2288	plants(h)	forest, grassland, wetland	\$2.00	100%	seed mixes
How Meadows Wildflower Seeds	38 Katherine Street	Kitchener	N2M 2K1	P:(519) 576-5856	seeds(h,w)	forest, grassland, wetland	\$2.00	100%	speaking engagements
Other Valley Native Plants	Box 31, RR #1	Eden	N0J 1H0	P:(519) 866-6639 F:(519) 866-6639	plants(h,w) seeds(h,w)	forest, grassland, wetland	\$2.00	100%	contract growing & seed collection contract growing; require listing of native plants
Phoon's Water Garden Centre	380 Kingston Road East, RR #1	Alex	L1S 4S7	P:1-800-663-0300	plants(h)	aquatic, wetland	free	<25%	
Prosoprylla	RR #1	Walsingham	N8E 1X0	P:(519) 588-3885	plants(h,w) seeds(h,w)	forest, grassland, wetland	free	100%	consulting
Redleaf Nurseries Ltd.	RR #1	Hornby	L0P 1E0	P:(905) 878-7166 F:(905) 878-0432	plants(w)	forest	free	25-40%	contract growing
Rockwood Forest Nurseries	RR #3	Cameron	K0M 1T0	P:(705) 374-4700 F:(705) 374-4700	plants(h,w)	forest	free	50-74%	
Royal Botanical Gardens	PO Box 399	Hamilton	L8N 3H8	P:(905) 527-1158 F:(905) 577-0375	plants(h)	aquatic, wetland	free	100%	contract growing
The Seed Source	RR #2	Oxford Mills	K0G 1S0		seeds(w)	forest	free		
Sweet Grass Gardens	Six Nations on the Grand River, RR #6	Hagersville	N0A 1H0	P:(519) 445-4828	plants(h,w) seeds(h,w)	forest, grassland, wetland			
Urban Forest Associates	331 Linamora Crescent PO Box 180, 1350 Canine Street	Toronto	M4J 4M1	P:(416) 423-3387 F:(416) 423-3387	plants(w)	forest, wetland	free	100%	consulting, contract seed collection & growing
V. Kruse Nurseries Ltd.		Carleton Place	L0R 1H0	P:(905) 888-4022 F:(905) 888-8080	plants(w)	forest	free	50-74%	
W. Richardson Farms Ltd.	PO Box 310	Port Hope	L0A 1K0	P:(705) 277-2112 F:(705) 277-1528	plants(w)	forest	free	25-40%	tree planting
Williams Nurseries Ltd.	RR #3	Leamington	N8H 3V8	P:(519) 328-6811 F:(519) 328-6200	plants(w)	forest, grassland	free	50-74%	
Winkelmann Nursery Ltd.	148 Lynden Road, PO Box 180	Lynden	L0R 1T0	P:(519) 647-3912 F:(519) 647-3720	plants(w)	forest	free	>25%	
Woodlands	Box 21-13	Burlington	N0G 1G0	P:(519) 335-3749	plants(w)	forest	\$2.00	25-40%	

This list is provided as a service by SER: Ontario Chapter. Sources included on this list are not endorsed by SER.

Please forward comments, additions and revisions for our 1997 list to:

Daniel Kraus, c/o Ecological Services for Planning, 361 Southgate Drive, Guelph, ON, N1G 3R2, P:(519) 836-6050, F:(519) 836-2493



Fisheries
and
Oceans

Pêches
et Océans

Bayfield Institute

Institut Bayfield

867 Lakeshore
Road

P.O. Box 5050

Burlington, Ontario

L7R 4A6

867, chemin
Lakeshore

C.P. Box 5050

Burlington (Ontario)

L7R 4A6

Your file *Votre*
référence

Our file *Notre*
référence

525-1329

January 6, 1997

Ms Denise Morneau
Ministry of Transportation
Planning Office, Central Region
3rd Floor, Atrium Tower
1201 Wilson Avenue
Downsview, Ontario
M3M 1J8

Dear Ms Morneau

**RE: Highway 407 / Transitway - Markham Road Easterly to Highway 7 East
of Brock Road - Environmental Assessment Report - Draft for
Presubmission Review**

Department of Fisheries and Oceans, Fisheries and Habitat Management (DFO-FHM) - Ontario Area staff have completed their review of "Highway 407 / Transitway - Markham Road Easterly to Highway 7 East of Brock Road - Environmental Assessment Report - Draft for Presubmission Review", dated December, 1996, and submitted by the Ministry of Transportation.

The procedures outlined in this report should adequately involve DFO-FHM in the review of proposed work, where appropriate, and should address concerns that DFO-FHM may have regarding this proposal.

Within the report there are several references to the mechanism that triggers the *Canadian Environmental Assessment Act* (CEAA) through the *Fisheries Act* process. It is the decision to issue an Authorization under the *Fisheries Act* that triggers CEAA. Several comments in the report indicate that an application for authorization under the *Fisheries Act* triggers CEAA, however, it is the decision to issue an Authorization which triggers the CEAA review requirements. Please note that the assessment under CEAA must consider any cumulative environmental effects likely to result from the project. These effects should be identified in your report.

The Ontario Ministry of Natural Resources (OMNR) and DFO-FHM will conduct site inspections for proposed watercourse crossing areas. The requirement for an authorization

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will be determined based on the site inspections, information regarding fish and fish habitat, the proposed method of crossing the water course and if the water crossing activity will result in a harmful alteration, disruption or destruction of fish habitat. Additional information, beyond that presented for water crossings, may be required to determine the potential impacts that may result.

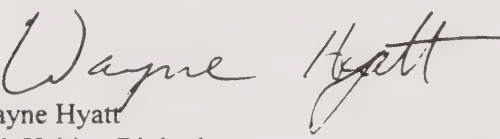
For each watercourse crossing, evaluations are made for type and significance of the fishery, significance of vegetation and wildlife, and corridor value. What criteria was used to make these evaluations? Are the stream classifications presented similar to those of OMNR? Watercourses are categorized as coldwater and warmwater. Are there any coolwater systems within this section?

Caution should be exercised when using qualifying statements for habitat significance. Note that Section 35(1) of the *Fisheries Act* states that "No person shall carry on any work or undertaking that results in the harmful alteration, disruption or destruction of fish habitat." This relates to all fish habitat, and does not categorize the quality of fish habitat.

Where authorization under the *Fisheries Act* is issued, a Monitoring Plan must be developed by the proponent, and approved by DFO-FHM and OMNR prior to the issuance of the authorization. The program generally includes monitoring for baseline information, compliance, and effectiveness. Contingency plans may be required if monitoring identifies conditions that are unacceptable to DFO-FHM. Appendix 16 - Summary of Input / Comments Received from External Team, page 17 of 24, states, under Project Team Response / Action, that there is "non-acceptance of monitoring requirements". Please explain this statement.

The report contains many phrases such as "where warranted", "where practical and feasible", "where site conditions permit", "where possible", etc. These are vague terms and may leave the impression that environmental considerations may not be dealt with in an appropriate and adequate manner. Mitigation of potential impacts is expected to be carried out to the greatest extent possible.

Please contact me at (905) 336-6236 should you have any questions or require additional information.


Wayne Hyatt
Fish Habitat Biologist
Fisheries and Habitat Management

c.c.	D. Ross	- OMNR, Aurora	A. Robertson	- CCG
	R. Dobos	- Environment Canada	K. Grady	- CEA Agency



P.O. Box 1000
Prescott, Ontario
K0E 1T0

January 15, 1997

8200-96-6063 ^{Your file} ^{Notre référence}

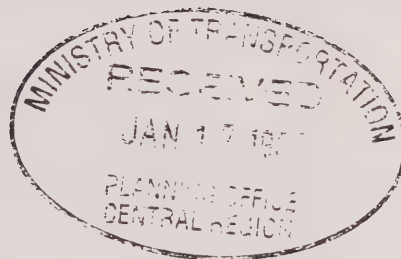
Our file Notre référence

Ontario Ministry of Transportation
Planning Office, Central Region
3rd Floor, Atrium Tower
1201 Wilson Avenue
Downsview, Ontario
M3M 1J8

Attn: Paul Jankowski, P. Eng.
Project Director

Dear Sir:

Re: Highway #407 Partial Extension



I have reviewed the Draft Environmental Assessment Study as requested December 9, 1996.

As a responsible authority for the Rouge River Bridge, I will limit my comments to navigation issues.

I assume, by copies of letters received, that all other federal authorities and responsible authorities are also responding to your request for review within their respective areas of expertise.

Throughout this document, the requirement for both *Navigable Waters Protection Act* (N.W.P.A.) and *Canadian Environmental Assessment Act* (C.E.A.A.) approvals/review of the Rouge River Bridge crossing is acknowledged and it is stated in Section 6.4.1. page 6-28 that all concerns relating to both navigation and environment will be addressed before approval is obtained. In this same section, you have also committed to design the bridge to avoid interfering with navigation.

Later in Section 6.5 page 6-37, you have further committed to addressing environmental concerns, identified both within the *Environmental Study Report* (E.S.R.) and during the future design process.


As the Canadian Coast Guard is a member of your external team for the Rouge River Bridge crossing and with the commitments noted both above and elsewhere in the Draft E.S.R., I believe concerns related to our Federal Authority have been identified and will be adequately addressed during the design stage to follow.

I note that in discussions with Mr. Bob Hodgins - Ecoplans, he indicated that during the design phase for the Rouge River bridge, the E.S.R. will be updated to provide more specific information and detail to fully meet the C.E.A.A. requirements.

I have no further comments pertaining to this Draft E.S.R. and have forwarded the document to our Regional Office in Sarnia. If any additional concerns are identified, I am sure they can be addressed and included in the C.E.A.A. document that will accompany the N.W.P.A. application.

If you have any questions or comments concerning the foregoing please contact me at 613-925-2865 ext. 255.

Yours truly



A. Robertson
Navigable Waters Protection
Program Officer
Canadian Coast Guard
Prescott Base

cc. EWOAE - c/w ESR
DFO - Fish Habitat
DOE - Rob Dobos

cc. Bob/Hodgins
Pat Proulx



Office
des transports
du Canada

Canadian
Transportation
Agency

January 20, 1997

Paul Jankowski *PJ*
Ontario Ministry of Transportation
Planning Office
3rd Floor, Atrium Tower
1201 Wilson Avenue
DOWNSVIEW, Ontario
M3M 1J8

Dear Mr. Jankowski:

**RE: Hwy 407/Transitway - Markham Road easterly to Highway 7 East of
Brock Road - Pre-submission Review**

I am writing in response to your letter of December 9, 1996 regarding the above noted highway project. Thank you for the opportunity to review and comment on the environmental assessment for the project prior to its submission to the Ontario Ministry of Environment and Energy.

The only aspect of the project which may concern the Canadian Transportation Agency is the proposed crossing of CP Rail's Havelock sub-division. As you are probably aware, if your Ministry negotiates an agreement with CP Rail, that agreement can be filed with the Agency to become an order of the Agency authorizing the parties to construct and maintain the crossing. In that case, an environmental screening pursuant to the *Canadian Environmental Assessment Act* (CEAA), would not be required. If however, no agreement is reached, the Agency may authorize the construction of the crossing pursuant to subsection 101(3) of the *Canadian Transportation Act* (CTA). Before granting such an authority, the Agency would be required, under CEAA, to conduct an environmental screening of the project.

The pre-submission draft of your environmental assessment contains no specifics of the proposed crossing. We recognize that the pre-submission draft was not intended to contain design specifics. We have no comments at this time, but should approval be sought under subsection 101(3) of the CTA, we would be prepared to review the preliminary design for the crossing and the associated site-specific environmental assessment at that time.

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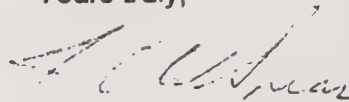
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Thank you for informing the Agency of your proposed project. Should you require any further information regarding our environmental assessment process, please feel free to contact Mr. Bill Aird, the Agency's Senior Environmental Officer, at (819) 953-9924.

Yours truly,



Ian C. W. Spear, Director
Rail Infrastructure Directorate

c.c. Bob Hodgins, McCormick Rankin





Office
des transports
du Canada

Canadian
Transportation
Agency

January 20, 1997

Paul Jankowski
Ontario Ministry of Transportation
Planning Office
3rd Floor, Atrium Tower
1201 Wilson Avenue
DOWNSVIEW, Ontario
M3M 1J8

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Brock Road - Pre-submission Review**

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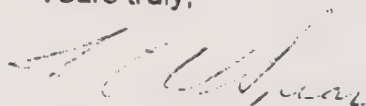
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... 2/

- 2 -

Thank you for informing the Agency of your proposed project. Should you require any further information regarding our environmental assessment process, please feel free to contact Mr. Bill Aird, the Agency's Senior Environmental Officer, at (819) 953-9924.

Yours truly,



Ian C. W. Spear, Director
Rail Infrastructure Directorate

c.c. Bob Hodgins, McCormick Rankin

APPENDIX 25
REFERENCES

NATURAL ENVIRONMENT REFERENCES

- Argus, G.W. and D.J. White. 1977. The Rare Vascular Plants of Ontario. National Museum of Natural Science, Botany Division, Ottawa.
- Argus, G.W., K.M. Pryor, D.J. White, C.J. Keddy, eds. 1982-88. Atlas of the Rare Vascular Plants of Ontario. 4 vols. National Museum of Natural Sciences, Ottawa.
- Caron, A.W. 1975. A Preliminary Inventory and Assessment of Some Streams in the Proposed Highway 407 Study Area. Ontario Ministry of Natural Resources, Lindsay District, 195 p.
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